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Our Future[1]

GRACE BULMAN

Chief, Dietetic Division, Department of Medicine and Surgery, Veterans Administration, Washington, D. C., and President-Elect, The American Dietetic Association.

IF WE agree that "it isn't the beginnings, it's the ends of things that count," we want to be doubly sure we are charting our professional course in the right direction. That is the only way we can assure ourselves that our future will be bright.

Whether in the treatment of disease or in the maintenance of buoyant health, we know that the practical application of the science of nutrition has forged steadily forward to take its place in service to mankind for a better world. We know, too, that without the recognition of scientific implications, dietetics was practiced from antiquity until the eighteenth century. In a Chinese medical book, an account of night blindness and its cure through diet was recorded during the Tang dynasty of the seventh century. A Doctor Thomas Moffet, born in 1539, just twenty years after the death of Leonardo da Vinci, wrote: "Wherefore let us neither with the Impudent, call Diet a Frivolous Knowledge,—or a curious science with the Imprudent; but embrace it as a Leader to perfect Health." With the work of Lavoisier, in the eighteenth century, nutrition was transformed from a concept of speculation to one of facts.

Familiar to us are the strides made over the past seventy-five years in food research, medicine, related sciences, and industry, which have raised nutrition to the position of international influence it holds today. At every turn, one is made cognizant of the broadening horizon for the "food specialist." The concept of nutrition only as treatment for the sick has long been outmoded, and we have happily turned to the old Chinese custom of paying the doctor to keep us well.

As we check our professional course, we might well ask ourselves what goals the founders of the American Home Economics Association and The American Dietetic Association had in mind for us at the turn of the century and in 1917. What did Ellen H. Richards and the others who worked with her hope for the future of home economics? What were the dreams of Lulu Graves when she became the first President of the newly organized American Dietetic Association in the days of World War I? From these thought-provoking questions, a basic answer evolves. It becomes clear that these pioneers realized our need for sound knowledge if we would build our profession on a firm foundation. Thus, they initiated the practice of looking to the college and university schools of home economics to provide those who would enter the field with the fundamental knowledge essential to building a strong professional base. The schools in turn placed their first emphasis on the education of teachers so that most of the early home economics students were prepared to teach "household arts" or "domestic science," depending on whether their interests were in clothing and textiles or in foods and nutrition.

As we recall, the first career opportunity for those who chose foods and nutrition for their specialty was in the field of hospital dietetics. This was followed rapidly by opportunities in health agencies, business enterprises, and organizations concerned with nutrition and feeding of mass populations.

EXPANDING OPPORTUNITIES

The demand for specially qualified persons, which increasingly exceeds the supply, is readily understandable as we review the choice of positions available. Openings in the hospital field are diversified to include administrative, scientific or therapeutic, and clinic opportunities. Administrative dietitians have proved their worth not only in hospitals but in college and university food service, in the school lunch program, and in commercial food service. The need for specialized preparation and experience to assume the many responsibilities of administrative positions cannot be overstressed. Clearly reflecting the significance of the job are such duties as initiating and operating effective food cost control systems, acting as consultant on layouts for alterations or new construction, being accountable for procuring proper foods and equipment, possessing an esthetic appreciation of good food, its preparation and service, and—of great importance—selecting and training dietetic

[1] Presented before the Florida Dietetic Association in West Palm Beach on December 6, 1952.

personnel to develop and maintain desired standards.

As we turn to the area of community nutrition, we know that nutritionists have made their place in public health and voluntary agencies, in colleges and universities as instructors in nutrition or institutional management, and in numerous other organizations concerned with public welfare. Mounting opportunities have been calling to dietitians and nutritionists who can combine inherent talents, interest, and experience with their professional training to serve food, equipment, and utility companies; radio; television; newspapers; and advertising agencies. Needless to say, those with an aptitude for the chemistry of foods and nutrition find positions in nutrition research.

Likewise, the school lunch program, with a continuing objective of better meals to more children at reasonable prices, has grown steadily in terms of the number of children served. The educational value of this and related programs is far-reaching. It has been apparent for some time that Mary carries home the nutritional knowledge learned at school, and consequently Mary's mother has learned and continues to learn better selection and better preparation of food. As the community has begun to assume responsibility for adult education, she has been educated to appreciate the advantages of the well-child clinic, and the food habits of the family are definitely being improved. Mary is being taught to select an adequate luncheon at school, and when she goes away to college these natural good habits will carry over, we hope, to an appreciation of the adequate, well-prepared food offered her at a minimal cost.

As we widen our horizons, we see that the welfare of man the world over has become a serious concern to all enlightened nations. We know that, as the status of man is improved, the socioeconomic status of the nation is raised. Regardless of our individual political leanings, we must see merit in such issues as the current Point IV program of our government and those programs of FAO, WHO, and UNESCO. The ultimate aim is to assist less privileged nations to a better way of life, to better nourished, healthier bodies, to subsequent peace of mind, and to happier living on a national and international scale.

WHAT OF THE FUTURE?

Those of us working in the atmosphere of institutional feeding are rapidly finding scientific developments to counteract our personnel problems. True, the age is still transitional and often difficult but the trend is clear. We have heard well founded predictions that food will be prefabricated and frozen in portions, that equipment is being produced to permit the processing of these portions to furnish appetizing meals with a minimum of labor; that pot washing will offer the excitement of a shooting gallery as pans are cleansed by compressed air; that dishwashing units will be vertical and there will be no unpleasant heat and steam in the operation, that "stacking" will be a lost art because dishes will unscramble themselves. In fact, we are promised a period when trays, dishes, and flatware will be disposable. The director of an institution food service will then find herself in a heaven on earth insofar as physical aspects are concerned.

Unfortunately this Utopia will not come to pass tomorrow and we must return to our practical workaday world of meal planning, personnel problems, and procurement. The daily tasks may not be encircled by a rosy aura, but we have seen the vista from the mountain tops, and while we work in the valley, we may and must return to the land near the sky for inspiration and broader concepts. You will recall Dr. Todhunter's statement in the JOURNAL (1) that "The world's work is done in the valleys, hemmed in, surrounded by the rush and bustle and routine, but from the mountain top comes the perspective, the meaning to all that you do throughout the busy day."

In this connection, I am reminded of an experience I had when spending a summer in the mountains. Our hiking club decided to camp out on the highest nearby peak. This required a 15-mi. climb over one mountain and across a narrow valley to the higher mountain. We reached the top of our peak at sunset and made friends with the mountaineer and his wife whose cabin was the only sign of civilization there. Before leaving our campfire at bedtime, the old man promised to return at daylight to show us the sunrise from the best vantage point. The next morning we followed him to a broad ledge of rock jutting out from the crest of the mountain where nothing could obstruct our view. With a wide sweep of his arm, he announced in all sincerity, "From this point you can see most of the known world!" It was a magnificent sight, one mountain after another until they met the colors of the sunrise.

In my mind's eye that gaunt figure silhouetted against the sky and pointing so proudly to his known world has come to symbolize the serenity, the clarity of vision, the widening of perspective that we need to be successful in this complex world.

WHAT DOES SUCCESS MEAN?

What does being successful mean to each of us? If we consider ourselves executives, can we not profit by the words of Dr. Burleigh B. Gardner, Executive Director, Social Research, Inc., Chicago, when he says:

> What is required in executives is the ability to grasp broad problems, weigh alternate courses of action, and then choose one course to act upon. This presupposes the ability to see the forest and the paths through the forest, despite the trees.

We are successful in our specialty when we work in an atmosphere of expectancy where everyone expects to do better today than yesterday and better tomorrow than today. It has also been said that "the quick-

est way to get to the top is always to get to the bottom of things," that the difference between the employer and the employee is that the employee knows how to do the job but the employer knows why it must be done. Our future outlook in the live and growing profession we have chosen depends on many things, but most directly on us.

The years since the turn of the century have shown how sound was the thinking of the pioneers in home economics and dietetics when they emphasized adequate preparation. Do we not still need basic courses as a foundation on which we may build knowledge in our particular specialties? Should there be a re-evaluation of these basic courses to determine whether their content meets present needs? Have not the years shown us also a need to strengthen our weaknesses in the application of our general and specialized knowledge? Do not the rapid advances in science, whether in the areas of foods and nutrition, institution management, human relations, or budgetary practices, make it imperative that all of us continually refresh ourselves at the "fountains of knowledge" within our reach? What additional learning experiences do we need—you and I—in our specialized fields of nutrition, diet therapy, school lunch, institutional, industrial, and commercial feeding programs, that will help us most in our efforts to contribute to the betterment of man and the betterment of nations?

What, then, do we expect of the colleges and universities, and what do they expect of us? During a recent alumnae conference at Teachers College, Columbia University, curriculum experts sought advice from those experienced in the practical application of the various specialties in home economics and dietetics. That is only one example of the cooperative efforts being made throughout our land to keep us moving professionally in the right direction.

PREPARE FOR OPPORTUNITIES

Without doubt we have endless opportunities in our future outlook. It can be a "rosy outlook" if we prepare ourselves fully and meet the expectations of our profession. The following little story seems to say the same thing in a different way.

Johnnie was an ardent lover of molasses, and each day his travels invariably took him to the home cellar where reposed a keg of this delectable sweet. He would stick his chubby little finger into the molasses and then quickly into his mouth. This kept up for some time, while the normal family use from the keg continued too. On a certain day, the level of molasses had fallen below easy reach. As Johnnie balanced precariously on the edge of the keg trying to make the desired contact, he suddenly tumbled in. Screams brought his mother to the rescue and, as she placed the dripping little fellow on the cellar floor, she said, "Now young man, what do you have to say for yourself?" Johnnie seriously replied, "I would ask God to make my tongue long enough to take advantage of my opportunities at all times."

Like Johnnie, we want to be ready to grasp our opportunities. Perhaps our prayer should be for guidance in taking the five steps to success that have been stated to be inquisitiveness, research, knowledge, power, and responsibility. An inquiring mind will lead one into research, which in turn will yield knowledge. With knowledge one gains power, and power brings responsibility. The way we carry our responsibility is the key to our future outlook. If we turn back to the early nineteenth century, we find a world similar to ours with its political struggles and aftermath of unsolved war problems. In that world the French philosopher, Joseph Joubert, said:

> We have received the world as an inheritance. None of us has a right to damage it—and everyone has the duty to leave it in an improved condition.

With our goal a world in an improved condition nutritionally, a future outlook to our liking is assured.

REFERENCE

(1) TODHUNTER, E. N.: Dietetics from the mountain top. J. Am. Dietet. A. 26: 191, 1950.

Check List for Planning a Dietary Department

Nine questions which should be considered before deciding on any one type of food service were outlined by Edith A. Jones, Chief, Nutrition Department, Clinical Center, National Institutes of Health, Bethesda, Maryland, when she spoke before the A.H.A. Institute on Hospital Dietary Administraion in Chicago on March 12:

(a) Will it be the type to provide an attractive tray—one that you could look forward to receiving three times a day if you were a patient?

(b) What will be the initial cost of installation?

(c) What will be the cost of maintenance?

(d) Can you afford the total installation and are you equipped to provide complete maintenance?

(e) Will it fit into the present building, if you are remodeling? If you have a new building, is it the best type?

(f) Will it increase the cost of food to be purchased?

(g) What staff do you need to operate it efficiently?

(h) What supervision is essential and can you provide that?

(i) What will it cost to staff this type of food service?

Citrovorum Factor

Nutritional Aspects, Associations with Leukemia and Anemia[1]

C. A. BAUMANN, Ph.D.
Professor of Biochemistry, University of Wisconsin, Madison

THIS discussion deals with the origins of the problem and with certain nutritional implications of the citrovorum factor (CF). An unusually thorough and well documented review of the biochemical and metabolic functions of the factor has appeared during the past summer (1), and several general accounts of the subject are also available (2–5).

DISCOVERY OF THE CITROVORUM FACTOR

The citrovorum factor was discovered at the University of Wisconsin in 1948 during a search for better organisms for the microbiologic determination of the non-essential amino acids (6).[2] Several microorganisms that showed failure to grow on purified media, according to reports in the literature, were chosen. One of the organisms in the series was *Leuconostoc citrovorum* (ATCC 8081). This organism did not grow on a synthetic medium which was entirely satisfactory for *Leuconostoc mesenteroides* and other popular assay organisms (9), but growth and acid production were rapid when very small amounts of certain liver concentrates were added to the medium. The commercial preparation, "Reticulogen," proved to be particularly well suited as a routine source of the new growth factor. From a medium containing "Reticulogen," single amino acids were then omitted, and the growth of the organism was found to depend on the amounts of the amino acid added back. In other words, suitable standard curves resulted, and in this way alanine was added to the list of amino acids that can be determined microbiologically (10). In the presence of all of the amino acids, *L. citrovorum* was used for the quantitative determination of the new growth-factor, and a "citrovorum unit" was defined as the amount per milliliter of medium that produces half-optimal growth of the organism.

The growth factor for *L. citrovorum* was shown to be present in a variety of plant and animal materials, and for a time it seemed possible that the organism might be responding to vitamin B_{12}; this was during the interim period after the success of the *L. leichmannii* assay for vitamin B_{12} had been announced but before the essential details of the procedure were available to biochemists. An attempted correlation between citrovorum activity, clinical activity, and APF activity, however, was inconclusive, and when vitamin B_{12} became available, it proved to be inactive for *L. citrovorum*. Thus the citrovorum factor (CF) was recognized to be a distinct entity (7). In the meantime, Lyman and Prescott (11) had separated two fractions from liver by electrodialysis, one of which had vitamin B_{12} activity, and the other, CF activity.

FOLIC ACID RELATIONSHIP

A connection between folic acid and the new factor was evident from the very beginning, for when moderately large amounts of the vitamin were added to the medium and the culture was incubated for three days (the routine procedure in amino acid assays), acid production was almost optimal, even in the absence of liver extract. But when the period of incubation was short, as in the 18-hr. turbidimetric assay, moderately large amounts of folic acid failed to stimulate growth, although growth was rapid in the presence of the liver extract. The liver extract used was known to be relatively low in folic acid as judged by the assay with *S. fecalis*. That the activity of the liver extract could not have been due to folic acid was shown by the preparation of a relatively crude concentrate, the activity of which

[1] Presented before the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952. Published with the approval of the Director of the Wisconsin Agricultural Experiment Station.

[2] To those who question the intrinsic value of the Ph.D. thesis, as distinguished from its pedagogic value, the contents of Dr. H. Sauberlich's thesis may be of interest. It includes: the introduction of a new and very useful organism, *Leuconostoc citrovorum* 8081, for the microbiologic determination of most of the amino acids; the first usable microbiologic assay for alanine; the discovery of the citrovorum factor; a method of assay for the factor, still widely used; the demonstration of a connection between the citrovorum factor and folic acid; and four sections on amino acid metabolism. Studies on the concentration of the factor and on the conversion of folic acid to CF were subsequently expanded (7, 8).

was greater on a weight basis than that of pure synthetic folic acid, under conditions selected for the optimal activity of folic acid (9). This preliminary method of preparation, however, was very similar to that used by others in concentrating folic acid itself, viz., adsorption on charcoal out of slightly acid solution.

OTHER INVESTIGATORS' WORK

These experiments were soon confirmed by others (12–16), and independent evidence for the existence of the factor was also published (17). Active programs were instituted in a number of different laboratories for the isolation and characterization of the active principle, and these resulted in the preparation of very active crystals (18, 19), and in the synthesis of a substance, known variously as "Leucovorin" or "folinic acid-SF" with most of the properties of the natural citrovorum factor (20–22).

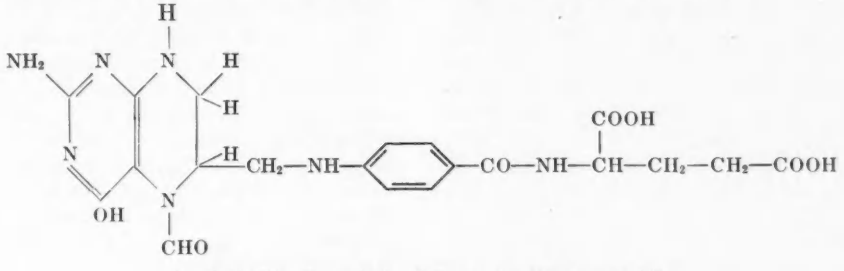
In the history of the vitamins it is not unusual that two or more independent groups of investigators arrive at the same new factor by different routes. And, after the existence of the vitamin is established, evidence for it can usually be recognized in older literature. Both of these generalities apply to the citrovorum factor. Pfiffner *et al.* (23) were apparently dealing with the citrovorum factor in 1947 when, during the process of concentrating vitamin B_c, they encountered an acid-labile antianemic substance which had many of the chemical and physiologic properties of the vitamin; acid lability is a characteristic chemical property of CF. Certain results by Dunn and associates on twenty-three lactic acid bacteria also suggest a preview of the citrovorum factor. In the first of their studies, *L. citrovorum* 8081 grew on a purified medium (24), in which folic acid was supplied as a concentrate from liver. In a later study, folic acid was supplied as synthetic pteroylglutamic acid (PGA), and *L. citrovorum* 8081 did not grow (25). However, the emphasis in these studies was not directed toward this particular organism.

The alternate approach to the citrovorum factor was made by Shive and associates during a study of inhibition phenomena. Methyl-folic acid was used to suppress the growth of *L. casei*, and growth was restored with various sources of folic acid. Synthetic PGA only partially restored the ability of the organism to grow, but preparations from natural sources were much more active (16, 17). These preparations were later shown to stimulate the growth of *L. citrovorum*. The active agent was concentrated and was designated "folinic acid," and a method was devised for the synthesis of a substance with very high CF activity (20, 22, 26).

The factor was not only shown to be very labile to acid, but under proper conditions the resulting product retained its folic acid activity as judged by the *S. fecalis* assay, while the response of *L. citrovorum* dropped almost to zero. Chemical studies led to the conclusion that "folinic acid—SF" was a reduction product of formyl folic acid. The designation "SF" or "synthetic factor" distinguishes it from the natural product.

Most of these latter observations were either soon confirmed or made by others in parallel independent studies. Sauberlich (27), for example, showed that *L. citrovorum* was inhibited by aminopterin, and that this inhibition could be reversed by concentrations of CF but not by folic acid. Others showed that preparations of CF restored the growth of mice or chicks (13) or embryos (28) exposed to aminopterin —or prolonged their lives—or prevented or cured the symptoms of toxicity (deficiency) (21, 29), and significantly, that the citrovorum factor was always superior to folic acid in this respect (30, 31). The phenomenon was found to be a general one and was observed in all species studied, including man, and also extended to pathologic conditions, e.g., to mice inoculated with experimental leukemia. A very active and successful research group at the Lederle Laboratories succeeded in synthesizing the citrovorum factor by methods not very different from those employed at Texas (32), and the resulting product is now available for clinical and experimental use under the trade name "Leucovorin" (21, 33).

The natural citrovorum factor has not been characterized but differs from "Leucovorin" in being twice as active to *L. citrovorum* on a weight basis (18, 34). Furthermore, on exposure to acid there are minor but definite differences in the relative activities of the products to *S. fecalis* and *L. citrovorum*, which measure "total folic" activity and CF activity respectively, and there are also certain discrepancies in absorption spectrum (35).



Synthetic citrovorum factor (Leucovorin, folinic acid-SF)

CONVERSION OF FOLIC ACID INTO CF

Thus far there does not appear to be any exception to the generality that forms of life requiring folic acid are able to convert it into the citrovorum factor. In most species this conversion is so rapid and efficient that the needs of the species are fully satisfied when pteroylglutamic acid is administered. Even *L. citrovorum* can make this transformation, but it is less efficient than other forms of life, and its usefulness as an assay organism for CF depends on this inefficiency. When very large amounts of folic acid are added to the medium, some growth of the organism is possible in the absence of CF, and growth is quite good when moderately large amounts of folic acid (PGA) are added to the medium and the period of incubation is prolonged sufficiently to let some conversion take place (9). All other organisms tested, and all higher animals, grow as well with PGA as with CF, unless an antivitamin is present. Thus the metabolic defect in *L. citrovorum* seems to be a very rare one, and while this defect may some day be found in other species, at present it is unique.

The omnipresence and apparent ease of the reaction PGA → CF makes it possible for animals to grow well on synthetic diets containing only PGA as the source of folic acid, and in most practical situations one could ignore CF except for the following:

(a) A major portion of the "total folic acid" in animals is CF (1, 36, 37).

(b) PGA fed to animals appears in the tissues and urine in large part as CF.

(c) CF is vastly superior to PGA in counteracting inhibitors to folic acid.

The latter is true both in animals and microorganisms, and suggests not only that CF is the more active form of the vitamin within the living cell but that the conversion folic acid PGA → CF may be impaired under conditions of stress (2, 30, 38).

As one would expect, considerable effort has been spent in a study of the conversion mechanism. The reaction is enzymatic, as shown by Nichol and Welch (39) when they took slices of liver and kidney from normal and deficient animals and incubated them with folic acid. Increases in CF activity were noted, and the conversion was particularly successful when ascorbic acid was added to the medium. A conversion in a cell-free system has also been claimed (1). It is now apparent that the conversion involves a reduction, and it is probable that the function of the ascorbic acid is that of a reducing agent rather than of an essential component of an enzyme system, although cysteine and glutathione were inactive in the liver slice experiments.

The need for ascorbic acid in the conversion PGA → CF in higher animals is apparent in certain experiments with severely scorbutic monkeys which also showed signs of megaloblastic anemia (2, 40, 41). Very small amounts of CF (folinic acid) cured the anemia without affecting the symptoms of scurvy, and the amounts of PGA needed were 100 times as large. Ascorbic acid cured both the scurvy and the anemia. In other words, one of the possible symptoms of scurvy is a failure of the animal to convert folic acid adequately to CF, with symptoms of folic acid deficiency (really "CF-deficiency") resulting.

The enhancing effect of ascorbic acid on the conversion PGA → CF has led to the suggestion that the occasional beneficial effects of ascorbic acid observed in scurvy-resistant species might be due to folic acid, or possibly vitamin B_{12}, rather than to ascorbic acid *per se*. This interpretation, however, seems premature; ascorbic acid is an excellent stabilizing agent for thiamine in ordinary laboratory diets (42), and it is at least as likely that past examples of obscure benefits due to ascorbic acid (1) were mediated through thiamine as through folic acid.

DISTRIBUTION IN NATURE

It is not possible at present to state exactly what proportion of the folic acid in foods or in various parts of the body is PGA and what is CF, although the amounts of CF are certainly large and probably equal 50 per cent of the total. The reason for the uncertainty is a lack of a suitable standard for assay purposes. Many of the differential assays that have been reported depended upon "Leucovorin" or "folinic acid—SF" as a standard, and both the absolute activities of these preparations and their activities relative to PGA for *S. fecalis* seem to differ from that of the purest material isolated from natural sources (18, 35). For several species, "Leucovorin" is about one-half as active as PGA (34), possibly because it is a mixture of stereoisomers only one of which is biologically active. Little is known of the relative activities of the various natural forms of CF (43).

It has been suggested that nearly all of the folic acid in nature is CF and that the PGA isolated during the original studies on the vitamin arose from changes incidental to manipulation (26). This is the extreme view, but is supported by the fact that CF is unstable to acid and that the resulting products are still active towards *S. fecalis*. Furthermore, natural material that contains "folic acid" invariably contains some CF. One is therefore tempted to regard folic acid (PGA) as a provitamin in much the same sense that carotene is a precursor of vitamin A. Both forms may exist side by side in certain foods, and both may also be present in the same tissue, but under ordinary circumstances the efficiency of conversion is such that the precursor effectively satisfies nutritional needs. Neither conversion is 100 per cent efficient (14), however, and when very large amounts of PGA are fed to human subjects, the urine may actually contain more PGA than folic acid (44).

Like all of the B-vitamins, the citrovorum factor seems to occur largely in a bound form in foods (15, 36, 37, 43, 45) and must first be released before it is available to the assay organism. The lability of CF to acid makes it essential that enzymatic methods of hydrolysis be employed. The existence of "folic-acid conjugates" is well-known (46), and the use of "conjugases" in the determination of folic acid has become standard practice (15, 37, 43, 45, 47, 48). The same enzyme preparations that release "folic acid" also release CF; actually, it was largely CF that was being released and measured as "folic acid" by the older workers. But the use of enzymatic methods of hydrolysis involves an element of uncertainty, since one cannot be sure that the release of bound CF has gone to completion; unfortunately there is no quantitative way of measuring "bound-CF" except by the biologic activity of its degradation products, and thus unreleased conjugate goes undetected.

It has long been known that several forms of folic acid exist which differ from one another in the number of glutamic acid moieties in the molecule. Apparently similar variations are possible in the structure of the citrovorum factor. Fractionation of natural products on a chromatogram results in a number of active zones (16, 43), and a series of products has also been observed by the bioautographic technique (49). The incubation of hemopoietic tissue with folic acid results in still another active factor which has been called hemofolin (50).

LEUKEMIA

Ever since the discovery of folic acid, periodic attempts have been made to associate it with the tumor problem. At one time the triglutamate of the vitamin was thought to have therapeutic possibilities, but as evidence accumulated, attention was fixed on the antagonists to folic acid rather than upon the vitamin itself. The most active of these are 4-amino-PGA (aminopterin), N^{10}-methyl PGA, or methylated aminopterin. Extensive surveys involving many compounds as well as many different types of tumors led to the conclusion that the antagonists frequently retard the growth of experimental tumors and sometimes stop it entirely (51–54).

But this inhibition was not observed in all tumors, and when antagonists were effective, the necessary doses were sometimes such that adverse effects resulted in the host. In one sense this is merely another illustration of an old difficulty in cancer research, viz., that dietary or chemotherapeutic means drastic enough to destroy a tumor also tend to harm the host. When enough folic antagonist is given to a tumor-bearing animal, the result is folic acid deficiency, both in the animal and in the tumor, and the problem becomes that of achieving a degree of deficiency that is more deleterious to the tumor than to the animal as a whole. It is not surprising, therefore, that there are tumors in which aminopterin treatment was ineffective.

The experimental tumors that have responded most consistently to the folic antagonists are the transmissible leukemias in mice (55–59), and there is a certain logic to this finding, since impaired blood cell formation and leucopenias are characteristic of folic acid deficiency. Apparently the requirement for folic acid (CF) for white cell formation exceeds that of the body in general, and the administration of a folic antagonist is therefore effective in diminishing the excess formation of white cells characteristic of leukemia. For some strains of leukemias, the treatment is completely effective; for others, a resistance to the antagonist develops after prolonged treatment (60–62), and this resistance seems to be hereditary. Furthermore, when prolonged high doses of antagonist are given, deficiency symptoms such as skin lesions develop. The lesions respond only poorly to folic acid, but the administration of the citrovorum factor results in their prompt disappearance (13, 21, 29, 30, 63–65) without, however, helping the animal against the leukemia. In fact, the administration of CF may actually shorten the life of the leukemia-bearing mouse by counteracting or minimizing the effect of the antagonist on the leukemia (66–68).

Experience with human patients with leukemia has been analogous to that with mice. The use of antagonists to folic acid, such as aminopterin or amethopterin, has resulted in a partial, temporary remission observed in a certain proportion of the patients (69–72 [ref. 71 lists 28 further references]). Better results have been obtained in children than in adults, and in a typical study, 32 per cent of 97 children showed remissions as contrasted to only 2 adults of a group of 38. In those groups that responded, there was a significant increase in mean survival time.

But even the best results were far from ideal. A major limitation seems to be that effective doses of antagonist do not remain effective and, for remissions to continue, must be increased until symptoms of folic acid deficiency result. These (2) include sore throat and mouth, anorexia, nausea, and vomiting, followed by stomatitis and pharyngitis. In more severe deficiency, ulces develop in the buccal mucosa and petechiae of the hard palate. Other symptoms may include alopecia, anemia, thrombocytopenia, and even leucopenia, and there is a tendency toward diarrhea and intestinal hemorrhage which may be sufficiently severe to cause death. It is in the treatment of these latter symptoms that the citrovorum factor becomes useful: skin lesions and ulcers of the mouth disappear when CF is given, CF being fifteen to fifty times as effective as folic acid. In other words, CF functions as an antidote to excesses of the drug.

About a year ago the daily newspapers carried an unfortunate article to the effect that the citrovorum factor is "useful against leukemia." Actually, the

exact reverse is the case; in counteracting the deficiency symptoms due to the antagonist, CF probably weakens the effect of the drug against the disease.

The citrovorum factor has been tried against other forms of malignancy, and there has been speculation that the combination of CF and aminopterin might result in a selective distribution of one or the other substance in tumors as compared with normal tissues, but to date attempts in this direction must be regarded as strictly tentative.

MEGALOBLASTIC ANEMIA

Spontaneous folic acid deficiency, either in animals or man, is comparatively rare, both because the vitamin is fairly widespread in nature and because it is produced by microorganisms of the digestive tract. For the production of deficiency in the laboratory, therefore, sulfa drugs are usually added to the diet. Nevertheless, certain species, such as the chick, grow suboptimally and develop blood dyscrasias when folic acid is omitted from the diet without any other alteration, while the response to folic acid of human beings with sprue or megaloblastic anemia suggests that an effective deficiency of the vitamin may also occur in man.

Perhaps the widest and most important clinical use of folic acid is in treating certain forms of pernicious anemia that are refractory to vitamin B_{12}. Such individuals also respond favorably to the citrovorum factor, and in a fairly large number of studies in laboratories in various parts of this country and in Britain (72–78), the activity of "Leucovorin" or folinic acid-SF appears to be approximately equal to PGA in this respect. A few related reports suggest that CF may be superior to PGA (1, 78, 79), but the discrepancy reported is not large. This would imply that the metabolic defect in megaloblastic anemia must be in some reaction other than in the conversion PGA → CF and lies rather in an inability to hold or make use of the moderate amounts of folic acid available in ordinary diets.

CITROVORUM FACTOR AS A VITAMIN

Wherever adequate tests have been performed, the citrovorum factor has fulfilled all of the biologic, nutritional, and enzymatic functions ascribed to folic acid itself (1, 2, 13, 19, 30, 34, 80–81). Its superiority to PGA in the presence of an antagonist, plus the demonstrated conversion of PGA → CF has led to the suggestion that CF either is the true vitamin or an intermediate step in structure between PGA and the true vitamin.

The metabolic role of folic acid in the living cell is not as clear as that of niacin or riboflavin, although much evidence links it to purine synthesis, to formate metabolism, and to general reactions involving the transfer of one-carbon fragments (1, 2, 4). Indeed, this is one of the most active areas of biochemical research today. However, no known derivative of either CF or PGA has been shown to function as a coenzyme in an isolated enzyme system. The "folic-acid coenzyme" is still unknown, and the assumption is that CF is a fragment of this hypothetical coenzyme.

The superiority of CF to PGA in the presence of an antivitamin might lead one to suspect a superiority in promoting the growth of deficient animals as well; in correcting deficiency symptoms; in curing megaloblastic anemia, either by producing quicker or more complete responses; or by functioning at a lower level. No such superiority has been observed, however, and the general conclusion seems to be that CF has roughly the same activity as PGA except when the conversion mechanism is impaired either by an antivitamin or by a severe deficiency in ascorbic acid. Since PGA is cheaper, it will continue to be used in ordinary circumstances. The lability of CF to acid is such that a substantial proportion of any ingested CF is probably converted back into a form of PGA by the acidity of the stomach prior to absorption. This objection would not apply to natural CF given parenterally.

The parallel between CF and pyridoxal is noteworthy. Pyridoxal is more closely related to the B_6 coenzyme than pyridoxine, it is more active than pyridoxine in certain microorganisms, and it is formed from pyridoxine in the body and appears in the urine when pyridoxine is fed. All of these situations match the connection between PGA and CF. But, as in the case of PGA and CF, attempts to demonstrate any nutritional superiority of pyridoxal over pyridoxine have usually been negative.

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Diet and Dental Health[1]

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As an integral part of the entire body, the teeth and their adjoining tissues are influenced by the same foods that affect other body tissues. Most tissues undergo active cellular exchange during the entire lifetime. The teeth themselves, however, once formed, show relatively little reactivity. Thus the problem of diet as related to dental status is its effect first, on the original structure of the teeth; second, on the oral environment; and third, on the structure and maintenance of the supporting or periodontal tissues of the teeth.

ORIGINAL STRUCTURE OF TEETH

Early studies of teeth were analyses of composition, listing the percentages of each chemical compound found. Since no significant differences were observed between teeth which showed high or low caries-susceptibility, it was held that structural differences were in no way associated with dental caries. Later a trace chemical, fluorine, was detected. Armstrong (1, 2) reported a significantly higher fluoride content in caries-resistant teeth than in caries-susceptible teeth which he analyzed.

That there might be differences in teeth other than those of percentage composition was not generally considered. Possible differences in structural arrangement did not receive much attention. Perhaps this was so because caries-resistant and caries-susceptible teeth do not show obvious physical differences. Yet even physical differences may occur without affecting percentage composition. This has been shown when samples of well-developed hard bone and soft crumbly bone have been analyzed. Such forms of bone will still have identical percentage composition. But when samples are analyzed on a per unit volume basis, there is a significant difference in the total amount of mineral in the two samples. It was some time before the basic understanding of trace variations in composition and the less obvious structural differences were applied to the study of teeth.

Now, more evidence is accumulating that there are structural differences in teeth which are likely to play a large role in the integrity of the teeth. Is this concept so strange? Is it not true with all other objects that original structure, that is, the materials which make up an object plus the way the components are put together, play a real role in the lasting qualities of that object?

DIETARY INFLUENCES

Back in the late twenties, the Mellanbys (3) studied one form of structural differences. Their research dealt with hypoplastic defects of the surfaces of the teeth as related to dental caries activity. They stressed the importance of vitamin D and mineral intakes during the formative periods.

More recently Sobel and his co-workers (4) investigated the inorganic composition of teeth which were developing during periods of dietary imbalance of calcium and phosphorus. Enamel and dentin of incisor teeth of rats on a high calcium-low phosphorus diet had a higher carbonate ratio than incisors of rats fed low calcium-high phosphorus or low calcium-low phosphorus diets. Because of these differences, it was stated that "the wide variations in composition which were produced suggest the need for considerable further investigation to determine the ability of the hard structures of the body to maintain themselves in health and disease when formed under circumstances which cause wide variation in composition." It is of interest that high carbonate apatites (the tooth enamel is an apatite structure) are more readily soluble in acid.

Leicester has said (5), "There is good evidence that the structure of the tooth itself may play an important part in determining whether the tooth will subsequently resist attack by microorganisms. The structure is determined either by conditions which prevailed in the organism when the tooth was forming, or by post-eruptive changes in composition and structure."

EARLY PREVENTION OF CARIES

If this assumption is accepted, then control of dental caries must be started earlier than has been customary. In fact, measures instituted after the child has been taken to the dental office with existing cavities are often no longer preventive. They must then, of necessity, be largely corrective.

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We have been short sighted. We have attempted dental caries control after improper dietary habits have been established and after the teeth have been formed. We need, instead, to promote dietary practices which will assure the building of more resistant teeth. That means better prenatal nutrition and better child nutrition. We need fuller appreciation of the fact that the nutritional status of the mother before as well as during pregnancy has a significant influence. Prenatal advice on diet alone is not sufficient. Such advice is premised usually on the assumption that the mother is in good nutritional status at the start of pregnancy. If we are to accept the data from dietary surveys of samples of populations of the United States, we know this is seldom so. Eppright, who studied 1051 adults in Iowa in 1946–1947, said (6) that only 5 per cent of the diets seemed adequate in all food groups. And you will recall that the report of Young and Pilcher (7) on rural, non-farm, and village families in New York State recorded that women of child-bearing age and adolescent girls had the worst diets. Half of the women of child-bearing age had intakes of less than 50 per cent of the recommended allowance for calcium. Adolescent girls ran a close second.

We know from animal researches that if the mother did not eat properly previously, even an excellent prenatal diet does not guarantee the best nutrition for the developing fetus. Although it is always important to follow the best possible dietary pattern during pregnancy, the greatest benefit to the developing fetus is obtained when there has been good storage of essential food factors prior to pregnancy.

We know that children born of mothers who had good diets have better health during the first year of life. The health and diet of the infant have direct and indirect effects upon the structure of the teeth. A substantial share of the permanent (second set) upper and lower front teeth and of the first or six-year molars forms during this early period. A survey by Sarnat and Schour (8) provides data that 70 per cent of all gross hypoplastic defects of these permanent teeth occurs before the child is one year of age. These defects are seldom associated with specific childhood diseases, such as measles, as was taught for so long. They are apparently due to seemingly subclinical metabolic disturbances. These include feeding difficulties, infantile rickets, tetany, diarrhea and vomiting, or other unsatisfactory neonatal adjustment.

PRENATAL DIET

On the other hand, prenatal factors influence the first set, or deciduous teeth, more than do postnatal factors (9). The dentin and enamel of the deciduous teeth start calcifying about the fourth fetal month. It is evident from many researches that prenatal nutrition is important in the quality of teeth formed. Why was this type of evidence so slow to be considered? Possibly one reason was that the total amount of mineral found in the teeth of the newborn babe is so small proportionately to the amount which the mother has stored in her body, that it was inconceivable to many that a shortage of mineral could occur. Were we not taught for so long that the fetus was a parasite, and thus only the mother could suffer inadequacies? Present research and investigations have made it clear that this old concept is false.

A generous amount of all tooth building materials, not only minerals, but the essential vitamins and amino acids as well, must be provided for the mother, if the developing child is to have well-built teeth. To accomplish this, diets for pregnancy should be prescribed in specific terms. It is not enough to tell the prospective mother to keep her weight down and to eat lots of fruit, vegetables, and milk. Instead, she should be given quantitative patterns of the size and number of servings of each class of food to be eaten. She should be advised to supplement with vitamin D either through use of vitamin D milk or pharmaceutical preparations.

POSTNATAL DIET

During the interval beginning at birth through approximately eight years of age, the permanent dentition is forming. The adequacy of the child's diet during this period is highly significant. The surveys of dental caries incidence by Sognnaes (10) provide evidence of the influence of the diet on the composition of the teeth as related to caries experience. Studies of the teeth of European children during and after the war indicate that, at least in the countries of northern Europe, the observed reduction in dental caries did not exactly parallel the period of reduced sugar consumption. Rather, the younger children, whose teeth developed during the period of low-sugar intake, showed a caries reduction in the postwar period, when sugar consumption was again high. The caloric needs of the children had been met during the war years by greater consumption of locally available foods in place of the imported refined foods.

Furthermore, Sognnaes (10) studied the effects of the type of diet fed the mothers of litters of experimental animals on the caries-susceptibility of the offspring. Whereas the caries-producing diet does not ordinarily produce caries in the laboratory animal unless the food contains coarse particles, offspring of mothers fed the cariogenic ration in finely divided form did develop severe caries in three months. His findings indicate influences at work far beyond those that would be expected if the carious destruction was determined solely by factors operating after tooth eruption.

DIETARY INFLUENCES ON ORAL ENVIRONMENT

Diet not only influences the original structure of the teeth, but also affects their oral environment. This is a two-fold action. One is the possible local action of refined carbohydrates when held in contact with the teeth. This must be considered in relation especially to those sugars which can penetrate the dental plaque most readily. With the use of concentrated sugar solutions, decalcification of enamel under the plaques occurs invariably. This would explain why most of the natural foods of acid character will not ordinarily cause a decalcification or dental caries.

The local acidity becomes high immediately after sweets are taken into the mouth, and a large part of the decalcification of the tooth occurs in a few minutes. This is why too-frequent eating, especially of sweets, may be a potent factor. If food is taken at short intervals, it promotes a more or less continuous high acidity on the tooth surfaces. This is especially true of the areas protected from friction. Fosdick (11) has said, "There is little doubt concerning the fact that most individuals who eat relatively large quantities of concentrated sugar will have numerous carious lesions, and those who eat relatively small quantities of dilute sugar will have few carious lesions."

NEED FOR WELL BALANCED DIET

It is commonly accepted that reduction of sugar in the diets of caries-susceptible patients reduces dental caries. Circumstantial evidence indicates that reduction of refined sugar after the teeth are formed is effective in dental caries control even though the diet may be lacking in essential food factors. Yet we are not justified in merely glibly denying sugars or refined carbohydrates just because the teeth are already formed. We have a further responsibility to give advice that will provide for protection of all body tissues at all times. Thus we must promote diets which will supply proper amounts of every essential nutrient.

If the child eats the quantities of food required to furnish the allowances of essential nutrients, he will have no place for sweets. Eating problems frequently arise because the parent tries to force consumption of the proper kinds and quantities of foods at the same time the child continues to consume large quantities of sweets. It is impossible for most children to eat both. If they do, they will be greatly overweight. The sugar on cereals, jam on bread, sweet rolls, cookies, cakes, candy, ice cream, and sweet beverages must be reduced drastically. Adults in charge of children should follow a consistent, well planned pattern of daily diet. One can no more eat successfully by chance, whim, or fancy, than one can accomplish successfully any other goal without following basic rules. It is not enough in our land of plenty simply to satisfy hunger. The proper combination of foods must be used.

ROLE OF SALIVA

There is not only the dietary problem of the local action of refined carbohydrates upon the teeth, but there is also that of the influence of diet upon the potential protective action of the saliva. There is as yet very little specific evidence about this, although there are intriguing observations of variations in the action of saliva from different mouths. Item: saliva from caries-susceptible persons will dissolve more calcium than that from caries-immune. Item: differences in ammonium ion content, or urea content have been demonstrated. These are variations in quantity and composition. Some of these variations certainly are brought about by diet. Item: the ability to neutralize acids is governed by diet and nutrition. A well balanced, alkaline-ash diet will usually produce a highly buffered saliva. There is a relationship between caries activity and buffering capacity. Immunity in many caries-free subjects appears to be associated with the composition of the saliva.

There is also a physiologic action of the saliva which acts to harden enamel of erupted teeth. Everyone now agrees that teeth are not as hard when they erupt as they are some years later. The practicing dentist had often observed this, but researchers "pooh-poohed" the idea. They said that once the enamel-forming tissue is lost, the enamel is no longer able to change except through friction or decay. Now they recognize that enamel undergoes some kind of maturation process after the teeth are erupted, but the method is not established. Undoubtedly salivary composition enters into the process. Are there more readily available calcium ions in the saliva of some individuals? We need to learn much more about how to produce the most protective saliva for each person.

The recognized differences in saliva bring attention again to that controversial question: Is the presence of excess quantities of sugar in the diet more harmful because of the local action of sugar or because the sugar displaces significant food factors, which are needed to produce either a protective salivary composition or to develop better tooth structure? It is conceivable that the same protective qualities of the saliva, or even of the tooth, are not required when teeth are not subjected to the local high acid concentrations such as are produced by sugars or other highly refined carbohydrates.

If either structure or environment is good, the teeth will be good. A good environment is one which has a minimum of exposure to local action of refined carbohydrates, a protective saliva, and effective daily mouth hygiene. It follows that:

Good structure + good environment → good teeth,
Good structure + poor environment → good teeth,

Poor structure + good environment → good teeth,
Poor structure + poor environment → poor teeth.

We cannot leave the discussion of the dietary influences on oral environment without mentioning recent evidence obtained by the use of radioactive substances. Contrary to the long-held opinion that composition of a tooth once formed is unaffected by any nutritive factors, now that nutrients can be labeled, it is observed that the tooth is affected rapidly. For example, radioactive iodine will be found distributed extensively throughout a tooth extracted 5 hr. after the iodine in a glass of water was administered to the patient (12). Such evidence opens a wide field for determination of the actual effects of dietary substances on dental health. How do nutrients behave? What are the direct effects of the vitamins upon the tooth? Does sucrose penetrate the tooth? The answers are being sought.

EFFECTS OF FUNCTION

Periodically the idea is presented that increased dental function will reduce the incidence of dental caries. It is said that if we ate the more fibrous and hard foods, we would have fewer cavities. Some figures have been presented for proof. For the most part, these studies have not considered the differences in nutritive content as well as the differences in texture or need for chewing. However, recently Neumann (13) and associates reported a study using sugar cane as the fibrous substance requiring chewing. Children serving as controls were given the juice which had been expressed from the cane. In an eighteen-month period, the cane-chewing group had an average DMF (decayed, missing, filled) of 1.1 tooth per child and the controls had an average of 2.15. The authors state: "The difference of about 50 per cent in the occurrence of new teeth affected by caries in the chewing and the nonchewing group can be attributed to the additional function provided by the daily mastication of sugar cane. The actual inhibiting process is open to argument, between a purely mechanical detergent action of the fibrous food, and a metabolic effect of function on the organic structure of the teeth, causing an increased resistance to caries."

There are data to show that cleansing of the teeth will reduce the incidence of decay. Any mechanical agent which helps cleanse the surfaces of the teeth will reduce the development of decay. A toothbrush is perhaps the most dependable instrument.

PERIODONTIUM AND THE DIET

The third role of diet in dental health relates to its effect on the structure and maintenance of the tissues around the teeth. The original structure of these tissues is not so great a limiting factor. There is constant cellular change in both the jawbone and the soft tissues which cover it. The withdrawal of mineral substances occurs in the jawbone when diets are inadequate or nutritional functions are disrupted. This loss is a slow process, and a severe depletion of the skeleton occurs before the effects of the deficiency become obvious.

The high incidence of low-calcium diets thus has pertinent meaning so far as the status of the supporting bone of the teeth is concerned. This is in accord with the report of a statistically significant inverse correlation between food-calcium intake and degree of periodontal disease (14). That is, the lower the milk intake, the greater the loss of bone around the teeth and the greater the degree of periodontal disease in adults. Furthermore, calcium intake was found to be useful in prediction of periodontal condition. Inclusion of factors other than calcium, such as protein, animal protein, iron, vitamin A, ascorbic acid, acid-base excess, or age, resulted in prediction values no greater than for calcium alone. The correlation coefficient of 0.95 between calcium and milk in the diets shows that milk was the predominant source of calcium. Other foods can supply little of this essential mineral.

A recent report by Karshan and associates (15) included a table which indicated that they observed no differences in the percentages of low intakes of food essentials in individuals having periodontosis or healthy tissues. Such a percentage report may not present the true concept. The degree of deficiency and the stage of disease need to be considered in making evaluations. The subjects who showed the inverse correlation between calcium intake and degree of periodontal disease did not show group differences when judged merely on percentage of low intakes.

Information from direct study of human subjects and periodontal condition is limited. But changes in the jawbone have been produced readily and frequently in laboratory animals fed diets that are too low or improperly balanced in calcium and phosphorus or that lack vitamin D. The teeth of the experimental animals become loose, and after the animals are sacrificed, the bone around the teeth is found to be soft and crumbly, instead of dense and hard (16).

VITAMINS AND PERIODONTAL TISSUE

The soft tissues of the mouth, too, are readily affected by the vitamin levels in the diet. Everyone knows about the oral symptoms of scurvy resulting mainly from a severe deficiency of ascorbic acid and the sore mouths associated with very low intakes of the B vitamins. But the effects of the everyday, lesser deficiencies are not as well understood. This is due in part to a lack of finely discriminative diagnostic and medical tests to detect incipient deficiencies. Also, to the fact that diseases of the oral tissues usually have multiple contributing causes. Therefore, dietary supplementation which has been used as the sole treatment for gingivitis and perio-

dontal disease, or as commonly termed, sore and bleeding gums, has produced only little benefit.

The value of dietary supplementation or improvement as related to the rate of healing upon local treatment has not been studied with well-controlled subjects. There is an excellent study, however, which provided evidence of the relation of diet to maintenance of periodontal health after treatment. This was done by Linghorne *et al.* (17). They demonstrated that those adult men who ingested at least 75 mg. ascorbic acid a day, whether from food or pharmaceutical source, were much less likely to have recurrence of a previously treated gingivitis than those whose intake was no more than 25 mg.

SUMMARY AND CONCLUSIONS

The evidence from accumulated knowledge is convincing. If human subjects are to have healthy mouths, a satisfactory level of dietary essentials must be maintained regularly at all ages. I admit that diet and nutrition are not solely responsible, yet there are volumes of excellent researches which indicate that improved nutrition could play a greater part in development of our hereditary potentials than we have given it the opportunity to do. For control of dental disease, both of the tooth and its surrounding tissues, we must foster better dietary practices. We need to emphasize that the effects of diet are significant from the earliest beginnings of the teeth and continuously through life.

Thus if we are to receive all the dental benefits of good dietary habits and to practice truly preventive dentistry, we must start long before the child is born. And diet is important even for individuals who have lost all their teeth and are wearing dentures. Proper levels of minerals, vitamins, and protein are required to maintain satisfactorily the bone and soft tissues on which the restorations are placed.

When a mother asks, "Why does my child have so many cavities?" the reply may be: "Because the integrity and soundness of the teeth are determined by many things. These operate over a long period of time. They start long before birth and act continuously thereafter. They include the supply of materials from which the teeth are formed, the conditions under which formation took place, as well as the subsequent care of the teeth. This means that to build good teeth we must provide excellent diets during pregnancy. This must be followed by ample supplies of all essential nutrients throughout the tooth-forming period, which ends at about eight years of age. After eight years, the diets must provide a good environment for the teeth. This is accomplished more easily if fermentable sugars are used sparingly."

Good dental health does not concern only the teeth. Periodontal health is also important. Only when the supporting tissues are sound can the natural denture serve the individual comfortably throughout the lifetime. Thus diet is significant at all ages. It plays a key role in supplying substances required for proper development, structure, and maintenance of all dental tissues.

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Fluorine in Food and Drinking Water

Dental Health Benefits and Physiologic Effects

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WITHIN the remarkably short span of approximately twenty-five years, an extensive series of epidemiologic studies and supporting laboratory and experimental data have established the beneficial effects of fluoride drinking waters on dental health (1). This beneficial effect of fluorine in the drinking water is probably the most significant finding in the history of preventive dentistry.

The highly informative epidemiologic studies on the fluorine-dental caries relationship were made possible by the natural occurrence of the element fluorine in many communal drinking waters. Results of these studies revealed a reduction in dental caries by as much as 60 per cent in population groups aged twelve to fourteen years who had been exposed throughout life to certain natural fluoride waters (1). Actually, fluorine occurring naturally in drinking water has provided roughly 4.5 per cent of the population in the United States for several decades or more with a communal water supply containing 0.5 p.p.m. or more fluorine. These fluoride waters have already produced corresponding reductions in dental caries.

In support of the anti-caries effects of natural fluoride waters, there has been accumulating for about eight years substantial epidemiologic evidence that artificially fluoridated drinking water also has benefits on dental caries, similar to the benefits of a natural fluoride water. Thus, the drinking water of Grand Rapids, Michigan, has been maintained at a level of 1.00 p.p.m. fluorine since January 1945, using sodium fluoride as the fluorine carrier. In the fall of 1951, six and a half years after fluoridation was started, "there had been a reduction in dental caries rates in permanent teeth of Grand Rapids children, ranging from 66.6 per cent in six-year-old children to 18.1 per cent in the sixteen-year age group. Similar results have been obtained regarding the deciduous teeth" (2). Without presenting the details of this study and other similar studies (3–5), it can now be stated with assurance that a pronounced reduction in dental caries accompanies the use of drinking water which has been directly fluoridated at an optimal level of 1.00 p.p.m. fluorine. At the present writing, controlled fluoridation of public water supplies provides approximately 14 million people with drinking water containing an average of 1.00 p.p.m. fluorine. Included among the larger cities where drinking water is now fluoridated are Washington, D. C.; Baltimore; Indianapolis; and San Francisco.

SOURCES OF FLUORINE

It may be stated as a general rule that the daily consumption of drinking water containing 1.00 p.p.m. or more fluorine will dominate all other sources of fluorine in the average daily diet. Thus, with estimates of the average intake of drinking water varying from 1200 to 1500 c.c. daily, and with water fluoridated at an optimal dental level of 1.00 p.p.m. fluorine, upwards of 1.2 to 1.5 mg. water-borne fluorine may be consumed daily. Add to this the 0.20 to 0.30 mg. fluorine which will occur naturally in a day's food, and the total daily fluorine amounts to approximately 1.4 to 1.8 mg. (6). While the fluorine content of fluoridated drinking water is constantly under strict quantitative control, the amounts of fluorine in foods may vary appreciably from one food to another. Many analytical data relating to fluorine in foods have accumulated during the past decade or more, and the fluorine in a number of the more common foods, as presented in a previous publication (7), are shown in Table 1. A summary of the estimated daily intake of fluorine from food and from drinking water containing 1.0 p.p.m. fluorine is presented in Table 2.

A survey of these and other food fluorine data shows that the great majority of foods as consumed contain approximately 0.2 to 0.3 p.p.m. or less fluorine. Notable exceptions are tea and seafoods. The better grades of tea contain 75 to 100 p.p.m. fluorine (a cup of good grade tea contains about 0.12 mg.) whereas seafoods, as consumed, may contain 5 to 15 p.p.m. fluorine. About 0.1 to 0.2 p.p.m. fluorine

TABLE 1*

Fluorine in food (E.P.)

FOOD	UNIT OF MEASURE	FLUORINE	
		p.p.m.	*mg.*
Meat, Fish, Eggs, and Milk			
Chicken	1 lb.	1.40	0.63
Round steak	1 lb.	1.28	0.58
Beef	1 lb.	<0.20–0.29	0.09–0.13
Pork	1 lb.	<0.20–0.34	0.09–0.15
Pork chops	1 lb.	0.98	0.44
Pork shoulder	1 lb.	1.20	0.54
Frankfurters	1 lb.	1.67	0.76
Lamb	1 lb.	<0.20–1.20	0.09–0.54
Liver	1 lb.	1.43–1.59	0.65–0.72
Salmon (fresh)	1 lb.	5.77	2.61
Salmon (canned)	1 lb.	4.16	1.88
Mackerel (fresh)	1 lb.	26.89	12.18
Mackerel (canned)	1 lb.	12.10	5.48
Sardines (canned)	1 lb.	7.30	3.31
Shrimp (canned)	1 lb.	4.40	2.00
Eggs (whole)	1 egg (54 gm.)	0.12–0.42	0.01–0.02
Milk	1 qt.	0.07–0.30	0.07–0.28
Cereals			
Corn (canned)	1 cup (256 gm.)	0.20	0.05
Ralston (dry weight)	1 lb.	0.58	0.26
Cream of Wheat (dry weight)	1 lb.	0.55	0.25
Flour (dry weight)	1 cup (120 gm.)	0.27	0.03
Bread (dry weight)	1 slice (23 gm.)	0.54–1.00	0.01–0.02
Rice (dry weight)	1 cup (187 gm.)	<0.10	0.02
Spaghetti (dry weight)	1 cup (94 gm.)	0.80	0.08
Macaroni (dry)	1 cup (123 gm.)	0.82	0.10
Vegetables and Tubers (dry weight basis)			
String beans (canned)	1 lb.	0.67	0.02
Navy beans	1 lb.	1.70	0.68
Fresh beets	1 lb.	0.60	0.04
Cauliflower	1 lb.	0.45	0.02
Cabbage	1 lb.	0.70	0.03
Carrots	1 lb.	1.30	0.07
Celery	1 lb.	1.47	0.04
Lettuce	1 lb.	0.42	0.01
Onions	1 lb.	2.40	0.14
Peas	1 lb.	0.60–6.69	0.07–0.79
Potatoes	1 lb.	0.96	0.10
Spinach	1 lb.	1.11–7.97	0.04–0.25
Tomatoes	1 lb.	0.53	0.01
Turnips	1 lb.	2.60	0.11
Squash	1 lb.	0.63	0.01

TABLE 1, *concluded*

FOOD	UNIT OF MEASURE	FLUORINE	
		p.p.m.	*mg.*
Fruits (fresh weight basis)			
Grapefruit	1 medium (285 gm.)	0.12	0.03
Orange	1 medium (215 gm.)	0.07–0.17	0.02–0.04
Apple	1 medium (150 gm.)	0.20–0.70	0.03–0.10
Apricots	3 medium (114 gm.)	0.02–0.20	0.00–0.02
Grapes	1 medium bunch (100 gm.)	0.16	0.02
Pear	1 medium (182 gm.)	0.19	0.03
Peach	1 medium (114 gm.)	0.21	0.02
Plum	1 medium (60 gm.)	0.21	0.01

* Adapted from McClure (7).

is present in cow's milk, but no appreciable change in the quantity of fluorine in milk occurs when fluorides are added to the cow's ration or drinking water (7). Fluorides in the soil, or added by chemical fertilizers, have little or no influence on the fluorine content of edible plant produce. It appears also from all the available data, that food-borne fluorine as well as water-borne fluorine is largely available for the body's assimilation.

FLUORINE BIOCHEMISTRY

Granting, without question, the dental benefits of fluoridated drinking water and knowing also the approximate daily fluorine intake resulting from the continued use of such water, the question which remains to be considered is the physiologic effect surrounding such a complete population exposure to fluorine. The general belief that fluorine can be incorporated in public water supplies (at a level of 1.00 p.p.m.) with no unfavorable effects on the public health is supported by results obtained through clinical and epidemiologic observations on human subjects exposed to fluorine in one form or another, and to a lesser extent by extensive controlled studies on cattle, sheep, poultry, and swine, and on laboratory dogs, rabbits, guinea pigs, and white rats. The most characteristic feature of fluorine biochemistry is its accumulation in skeletal and dental tissues, and it is for this reason more than any other, that prolonged periods of excessive fluorine ingestion become incompatible with physiologic safety, unless this ingested fluorine is adequately eliminated from the body.

TABLE 2

Summary of estimated daily intake of fluorine from food and from drinking water (drinking water containing 1 p.p.m. fluorine and dry substance of food containing 0.1 to 1 p.p.m. fluorine)

AGE	BODY WEIGHT*	DAILY FLUORINE INTAKE			
		From drinking water	From food	Actual daily total	Daily total rate
yr.	*kg.*	*mg.*	*mg.*	*mg.*	*mg./kg. body weight*
1 to 3	8 to 16	0.390–0.560	0.027–0.265	0.417–0.825	0.026–0.103
4 to 6	13 to 24	0.520–0.745	0.036–0.360	0.556–1.105	0.023–0.085
7 to 9	16 to 35	0.650–0.930	0.045–0.450	0.695–1.380	0.020–0.068
10 to 12	25 to 54	0.810–1.165	0.056–0.560	0.866–1.725	0.016–0.069

* Figures for weight for ages one to six years were taken from tables arranged by Woodbury (8); figures for six to twelve years were taken from the Baldwin-Wood weight-height-age tables for boys and girls of school age (9). Reprinted with permission from the *American Journal of Diseases of Children* (6).

TABLE 3

Mortality rates due to nephritis in three Wisconsin cities

CITY	FLUORINE LEVEL OF WATER	YEARS	MORTALITY RATE PER 100,000 POPULATION
	p.p.m.		
Stevens Point	0.02	1945–49	32.0
Sheboygan			
pre-fluoridation	0.03	1940–44	41.3
post-fluoridation	1.20	1945–49	21.7
Green Bay	2.50	1945–49	28.7

The recognition of this important fact prompted the comprehensive survey of urinary fluorine excretion which was made prior to actual water fluoridation (10), and it was indeed significant for the future program of water fluoridation that upwards of 90 per cent or more of the fluorine in drinking water containing up to 4.5 p.p.m. fluorine was found to be excreted via the urine. This remarkably close correlation between fluorine ingestion and excretion has been demonstrated repeatedly in other human and experimental animal studies (1, 11–13). Thus, in an extensive study on five young men, complete fluorine balances—including fluorine losses through body sweat—furnished substantial quantitative evidence that fluorine in trace quantities is largely eliminated, particularly via the urine (14).

The hazard of toxic cumulative bone-fluorosis following ingestion of fluoridated drinking water seems to be essentially eliminated by normally efficient urinary excretion of fluorine.

EFFECT OF FLUORINE ON HEALTH STATUS

The health status of individuals living in areas in the United States where natural fluoride waters have been used for a long time shows no failure or impairment, aside from dental fluorosis, which could be attributed to the water. This has been affirmed by similar height and weight data, as well as bone fracture experiences, of boys and young men living in fluoride and nonfluoride areas (16). Also, a survey of the relation of fluoride drinking water to calcification of the carpal bones of children, age six to thirteen years, has revealed no indication that upwards of 4.0 to 4.5 p.p.m. fluorine in drinking water consumed regularly had any effect on calcification in the sensitive carpal bone areas (17). Among a group of 114 adults whose age averaged forty-three years for men and forty-six years for women and who had been exposed to as much as 8.0 p.p.m. fluorine in their drinking water for an average of twenty years, there were no systemic complaints which could be related to the fluoride water, and in only seven individuals were there signs of an incipient skeletal change apparent by x-ray examination (18).

Similar to this result is the observation that six adults ingesting known amounts of fluorine daily for a period of twelve years remained in metabolic balance with respect to fluorine, and adults ingesting daily 0.05 mg. to 0.14 mg. fluorine per kilogram body weight "over long periods" have shown no radiographic changes in their bones (15). It may be noted that the consumption of drinking water containing 1.00 p.p.m. fluorine plus food-borne fluoride will provide a daily fluorine intake which rarely exceeds 0.1 mg. per kilogram body weight.

Referring again to information pertaining to individuals now living in fluoride areas, there is no evidence of a specific kidney damage as shown by analyses for occult blood albumin and glucose in the urine of young men exposed to 2.0 to 5.2 p.p.m. fluorine in their drinking water (1). As a further basis for assuming there is no kidney damage associated with fluoridated drinking water, the nephritis mortality rates per 100,000 for three Wisconsin cities with varying concentrations of fluoride in the public water supply are cited in Table 3. Any suggestion that a kidney damage will become associated with fluoridated drinking water has no supporting clinical or epidemiologic evidence at this time.

Whereas consistently negative results are identified with the epidemiologic and clinical fluorine studies noted above, it is not to be implied that fluorine in drinking water in excess of 1.0 to 1.5 p.p.m. is entirely innocuous. One of the most thoroughly veri-

fied toxic effects of excessive water-borne fluorine is dental fluorosis commonly known as mottled enamel (19)—a dental defect which in its moderate and extreme condition may cause a very unsightly appearance in the teeth. There is every assurance, however, that 1.00 p.p.m. fluorine in drinking water does not cause mottled enamel discernible by any unsightly appearance of the teeth.

TOXIC LEVELS

Observations in fluoride areas outside the United States have suggested that nondental chronic toxic effects result from excessive quantities of fluorine in drinking water and perhaps from fluoride-contaminated foods. It is the consensus, however, that the fluorine exposure of the afflicted (fluorosed) natives involved in the majority of these studies exceeds any level of water-borne fluorine encountered in the United States, and that other local factors, i.e., malnutrition or lack of satisfactory control groups, may have modified these results (20–23).

An additional, and perhaps the most valuable source of information on the chronic effects of fluorine on human subjects is contained in clinical and autopsy studies of adult men and women exposed to fluorine in certain industrial operations. The classic studies of the late Kaj Roholm pertaining to cryolite workers (11) dominate this field. Nevertheless, the evaluation of these observations must be tempered by realization that the quantities of fluorine which produced these effects are in very considerable excess of water-borne fluorine exposures.

For precision and volume of data on fluorine toxicosis, the results on domestic and small experimental animals obviously exceed all other sources of information. Application of these experimental results to problems of public health hazards from fluoridated drinking water are unfortunately greatly limited, primarily because of the great disparity in the quantities of fluorine involved and also on account of differences in species susceptibility and duration of the periods of experimentation and fluorine exposure. In cataloguing these extensive results of animal experimentation, it should be emphasized that a more significant epidemiologic and clinical research "laboratory" exists in the many thousands of human subjects who have been exposed to natural fluoride waters for many years and whose response to fluorine in drinking water may be resolved ultimately by the direct observation and study of their health status.

SUMMARY

It should be emphasized that there is no doubt that fluoridation of drinking water at a level of 1.00 p.p.m. fluorine is an adequate public health practice for the partial control of dental caries. It is not justified, on the other hand, to anticipate the total abolition of dental caries through the use of fluoridated drinking water. Dental research has produced no adequate answers as to causes of dental caries, and future knowledge as to causative factors may provide additional measures for even more complete caries control. In passing it should be noted that upwards of 35 per cent of the population of the United States do not use a communal water supply, and no plan has been devised to incorporate fluorine in the diets of these people.

In the light of all the evidence available at this time, the only unique lesions thus far associated with mild chronic fluorosis involve the teeth and bones, and in the absence of those lesions it may be safely assumed that a hazard of chronic fluorosis does not exist. Nonetheless there is need for continued research designed to elucidate further the public health aspects of fluoridated drinking water. Fluorine research must be continued in order to gather additional information applicable to the practice of fluoridation of public drinking waters as an effective dental health measure.

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Fluorine Content of Wine

Wine has been reported to be high in fluorine content—from 5 to 7 p.p.m., according to von Fellenberg[1] and de Almedia[2]. Their papers do not mention the cleaning of wine tanks and casks with sodium fluoride, but this was a former practice, and no hazard has been reported from this type of fluoride usage. Where the consumption of wine is high, as in many European countries and South America, speculation might be that this causes an unusually high dietary intake of fluorine.

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—Alice Glenn Keaton, Supervisor of Nutrition Services, Mississippi State Board of Health, Jackson.

Costs of Hospital vs. Commercial Feeding

The dietary department in a hospital is a service department waiting on the needs, pleasures, and comforts of the patient. Because of hidden costs, as compared with commercial feeding, it is sometimes considered to be an expensive service and hospital management may question why it costs so much.

People come to a hospital for cure and treatment of an ailment, and every department is geared to help the patient recuperate. One of the essentials in illness is to give the body proper nourishment, and this means simple but good food. A hospital should not economize on milk, eggs, cheese, meat, and other protective foods or add a filler to food to reduce its costs, as is often done in a commercial feeding operation. It is possible to use the cheaper foods if that is the policy of the institution, but even then the food must contain the required nutrients and it must taste good to the patient.

Purchases for hospital and commercial feeding differ in type and quantity. In addition to regular food, hospitals must buy sugar-free canned fruit, salt-poor vegetables, salt-poor bread, protein concentrates, vitamin preparations, non-caloric sweeteners, sodium-free milk, and evaporated milk for formulas. All of these add to the cost of hospital feeding.

With some illnesses, food instead of costly medicines is the treatment used by physicians. The patient is said to be on a modified diet, but often overlooked is the fact that the food for this type of treatment may cost more, and its preparation and serving require special effort. It takes the dietitian's time to plan variations from the menu for special diets, the cook's time to prepare small quantities of food, and extra service time on the floors. The patient on a special diet must be visited and special attention given to his likes and dislikes, and an attempt made to satisfy his desires while staying within the prescribed diet.

Because patients in a hospital are below par, appetites vary and people will refuse food placed before them, or suddenly feel so badly at mealtime that complete trays are canceled. This results in wasted food and is a cost not found in commercial feeding.

A hospital is organized to serve three meals a day, seven days a week to bed patients, wherever they may be. This involves a cost which is taken for granted in a hospital, but which is charged for at a fairly high rate by hotels as room service. Also, in addition to the usual meals, milk and beverages are available for between-meal feedings if patients desire them, which increases the food cost by 25 cents or more a day, for which a hotel would charge not only for the food but also for the room service.—*E. Alliene Mosso, writing in Bureau Dietary News No. 33, March 9, 1953.*

Sanitation in the Food Service Department[1]

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PEOPLE the world over have come to realize that food plays a most important part in our lives, not only from a standpoint of quantity and nutritional value but also from a safety point of view. Dietitians serve an aggregate of millions of meals a year, and through your food service you directly affect the lives of those people whom you serve. Indeed, you have a very responsible task to perform, the importance of which is little known or seldom considered by your consuming public.

Many people consider food sanitation as a relatively new program. In the intensified form in which we see it today, it *is* rather young. Intensive efforts in this area have been applied only since about 1934 when the recommended ordinance of the U. S. Public Health Service was first written. Actually, of course, food sanitation dates back probably as far as man himself. Hundreds of years ago kings were protected by employing official food tasters. This protection was primarily directed against chemical food poisoning. However, our history books tell us of other preventive measures. Pork was forbidden by the Jewish people probably because they, in some way, understood that they could become ill from eating it. The picture today is constantly changing. Modern methods of food processing, storage, transportation, and serving have been doing much to cut down the possibility of transmission of disease through foods.

The dietitian and sanitarian today play an important part in the evolution of food sanitation. The modern dietitian is of necessity a sanitarian, while the present-day sanitarian would do well to know more about dietetics. No matter how nutritious or palatable foods may be, a lack of basic sanitation in their storage, preparation, serving, or handling may cause them to produce illness or even death. While a dietitian is vitally concerned in providing optimal nutrition in order to raise the vitality and vigor of even the healthy body, she must never for a moment forget the impact of food poisoning on her entire program. Many of you undoubtedly have heard the slogan of the National Sanitation Foundation, "Sanitation Is a Way of Life." This is particularly important in food service departments because lack of it may result in death to your consumers. Since the dietitian is charged with the responsibilities of all the food service within her establishment, she must know and understand the basic fundamentals of food sanitation.

Because of the magnitude of the field of food sanitation which involves all of the steps between the farm and the consumer, we will limit our remarks to specific problems which arise in the institutional type of operation in which we normally find a dietitian employed. Those I have selected for discussion are:

(a) Food poisoning.
(b) Contagious diseases in food service workers.
(c) Proper handling of milk.
(d) Training of food service employees.
(e) Need for self-inspection.
(f) Construction of equipment and utensils.

FOOD POISONING

Just what do we mean by food poisoning? Dack (1) speaks of it as ". . . illnesses resulting from ingestion of food containing certain inorganic chemicals, poisons derived from animals and plants, and toxic products or infections caused by several species of bacteria." Immediately, it becomes apparent that we are dealing not only with chemicals in food, but also with naturally poisonous plants and animals as well as food infections and food intoxications. The latter are responsible for more outbreaks today than any of the other types.

To illustrate the importance of food poisoning, I have reviewed the U. S. Public Health Service annual reports on food poisoning for two recent years. In 1949, there were 367 outbreaks involving

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 23, 1952.

9,043 persons of whom 11 died. In 1950, there were 347 outbreaks involving 10,174 people and 5 deaths. It is estimated that only 10 to 15 per cent of the actual cases are reported, so it is easy to see that food poisoning generally greatly affects the lives of a large number of our people. These statistics were from outbreaks either from a family meal or one eaten outside the home. Breaking this down further, we find that of the 367 cases in 1949, at least 26 occurred in institutions; of the 347 cases in 1950, 29 were in institutions.

These statistics on food poisoning point up a very important fact. Either we are not familiar with basic fundamentals of food poisoning prevention, and therefore, have failed to protect our foods—or there has been a breakdown in preventive practices. Particularly, in hospitals do we find the need for complete control of food handling since many people could succumb to an outbreak of food poisoning because of their lowered resistance due to the illness that caused them to be hospitalized.

What can you, as an individual, do to prevent food poisoning?

First, you should individually become well versed on the subject, after which you are then in a position to convey preventive knowledge to your employees to reduce the likelihood of an outbreak. Excellent textbooks are available, written by such authorities as Dack (1), Dewberry (2), and Tanner (3).

Another thing which you can do is to investigate very thoroughly any suspected outbreak. The International Association of Milk and Food Sanitarians has set up a committee on communicable diseases affecting man. At present, this committee is developing a standard procedure for investigating food poisoning outbreaks. When this procedure becomes available, I would highly recommend that those of you who are in a position to do so establish a team, preferably composed of an epidemiologist, chemist, and sanitarian, to investigate any alleged outbreak with the aid of this procedure. If this is impossible, promptly on receiving information of a person suffering from food poisoning symptoms within your establishment, you should report the matter to your local or state health department, at which time they will assist you in making the investigation.

Food poisoning is not something to cover up. Only by proper investigation and subsequent changes in procedure can you hope to reduce the chance of having another outbreak even as early as the next day. This is your responsibility, and not one which can be taken lightly.

CONTAGIOUS DISEASE IN FOOD SERVICE WORKERS

Sanitarians are from time to time confronted with the question, "What should be our procedure in handling the problems of contagious disease in food service workers?" Primarily, we should be concerned with diseases which have been reported as causing the greatest difficulty through transmission by foods. Reports on disease transmitted through foods, as tabulated by the U. S. Public Health Service, show that our major problem is one of food infection and food intoxication. Under the former, we find diseases such as salmonellosis, typhoid, and the common cold.

The latter (food intoxication) is responsible for more food outbreaks than any other type of food poisoning. In this particular instance we are dealing with *Staphylococcus aureus*. Since this is the major offender in reported outbreaks, it is one which we should consider most closely. This particular organism is found quite commonly in the air; in the food service worker's nose and throat; and in infected cuts and abrasions, boils, pimples, and the like. Immediately, we can see that the usual health certificate which has been demanded for so many years by health departments is of little value on a once-a-year or so basis in combating this dangerous source of food poisoning. Undoubtedly, you are wondering, "Well, what about typhoid fever?" New York City has spent approximately $50,000 for each typhoid carrier found through examinations of food service workers. Generally speaking then, certificates for food service workers, as commonly administered, are of questionable value.

Although I have painted a rather dark picture for physical examinations of food service workers, there is one point at which such examinations can be considered worth while. Many institutions are requiring, as a pre-employment practice, examinations which include a chest x-ray and a morbidity history on all prospective food service workers. In the event the applicant's history indicates previous infections which may result in his being a carrier, such as in the case of typhoid, the necessary stool examinations can be requested.

One thing, however, should be borne in mind at all times. Such examinations will not necessarily uncover the major offender in food poisoning outbreaks, the Staphylococcus organisms. Only constant and careful vigilance will ferret out the food service worker who may contaminate foodstuffs with these organisms, and even careful control of his health may not prevent all Staphylococcus outbreaks. This is the reason that keeping foods hot or cold is considered so essential in our attempt to eliminate all of these outbreaks.

Of course, there is always the responsibility of management to see that employees do not handle foods or utensils when ill. This responsibility should also rest with the food service worker himself, but little will be done about this unless the manager or supervisor takes the action.

PROPER HANDLING OF MILK

I understand that the practice of serving milk from a pitcher in the ward diet kitchen is quite common in many of our hospitals. Or, instead of this,

the milk may be poured into a glass in the main kitchen and transported through the corridors unprotected. Why? Administrators tell us that it is not economically feasible to serve milk in individual containers or to use bulk dispensers, but we are slowly finding hospitals in various sections of the country which are disproving this. Some have begun to buy their milk for room service in ½-pt. paper containers or have installed approved bulk milk dispensers in their main cafeterias. Certainly, we cannot justify the handling of milk in unsanitized pitchers on a basis of economy alone. Of all the foods we eat, milk is perhaps the most susceptible to bacteriologic contamination. The handling, therefore, of such a product demands the utmost in sanitation.

TRAINING OF FOOD SERVICE WORKERS

We now come to the fourth major problem confronting food service departments. Training for food service workers has received much attention in the past five or six years and is a subject which alone could take pages of discussion. However, for the sake of brevity it might be wise merely to point out the one factor which is outstanding with hospitals and similar institutions regarding training for food service workers. That is, that in general these institutions do not have the turnover of labor so common in other segments of the food industry. As a result, you are in a much better position to institute and maintain sound training programs for food service workers. I urge each of you to contact your local health department to learn whether they can provide personnel to help with such training. In the event they can, you can set up a schedule for training of all food service personnel in your establishment.

Proper training in this area requires repeated instruction and example to the food service workers if these programs are to be successful. We know from experience that the food service worker uses improper practices primarily because of habit, and all of you are familiar with the difficulties encountered in changing the habits of adults. The answer, of course, to this whole problem lies in training our younger generation in their more formative years to practice good personal hygiene if we are eventually to make them into satisfactory food service workers.

The U. S. Public Health Service has recently developed, largely through the efforts of Dr. James Lieberman, a manual titled *Instructor's Guide—Sanitary Food Service* (4). This book is exceptionally valuable to persons who are interested in the training of food service personnel. It contains not only information on how to conduct food service training but also gives detailed information on materials to be used and a wealth of references covering the complete subject. It contains the thinking of the experts in the field all over the United States. I strongly urge you to make this book a portion of your personal library.[2]

NEED FOR SELF-INSPECTION

Health departments throughout the country are becoming quite conscious of a tool which they have begun to realize is of great importance to the food serving establishment in the maintenance of proper standards of sanitation. This tool is quite simple to understand and apply, and yet is perhaps one of the most difficult ideas to sell to commercial-type eating and drinking establishments. Institutions, in general, are much more ready to accept it, and it is being applied effectively in practically all sections of the country. I am, of course, referring to self-inspection. Many institutions rely upon the health agency which inspects their facilities to inform them when a violation has been noted. New York City was the first to take action to apply the self-inspection idea.

The effectiveness of self-inspection is based primarily on the idea that a daily analysis of food handling techniques, together with an inspection of the physical facilities provided, will minimize the possibility of a build-up of filth in any part of the establishment. Those portions of the food service department which have not been thoroughly cleaned on one day can be taken care of the next day, provided the management knows of the existence of this lack of cleaning. Where institutions rely on health department inspections, there may be a lack of cleaning in certain areas for as long as one to three months since official agencies can hardly make inspections more often.

Many institutions have made cleaning schedules, pinpointing the responsibility of cleaning a given area to the personnel who work within that area or to specific clean-up persons. In the event a lack of cleaning is noted on a daily inspection, this particular individual can have this matter called to his attention and it will be corrected within 24 hr. Failure to call this to his attention may result in an indefinite time before the clean-up has been accomplished. You will find that those institutions which have a satisfactory record of sanitation also have good cleaning schedules and a self-inspection program.

There is another reward which accompanies self-inspection and which can be of even greater value than esthetic cleanliness. Through these inspections, hazardous food handling practices can be readily uncovered before they can cause food poisoning outbreaks. An example of this would be to find improper refrigeration of perishable products.

I sincerely hope that each of you will give some serious thought to this subject, if you have not already done so. I can assure you that it will be time

[2] Available from the Government Printing Office, Washington 25, D. C., for $1.50.

well spent and may be responsible for saving lives. If you are to maintain a high level of sanitation, daily inspections are a "must" to guarantee that all cleaning is being carried out in a satisfactory manner.

EASILY CLEANABLE EQUIPMENT AND UTENSILS

The last problem which I have listed as being of importance to you is construction of equipment and utensils so that it is easily cleanable. There is perhaps no other phase of food sanitation which is in a greater state of flux at present than the construction and manufacture of food service equipment and utensils. The establishment of standards for equipment and utensils is one phase of food sanitation which has developed rapidly over the past four years. We have been conscious of the need much longer, but in 1948 active steps were taken to correct the problem which plagued health departments, food service departments, and equipment manufacturers alike. Because of the wide variety of equipment being installed and because much of it was designed and manufactured in such a way that it would not be easily cleanable, a movement was begun to develop standards which would guarantee satisfactory equipment and satisfied users of this equipment. The National Sanitation Foundation was selected as the appropriate agency to issue minimum standards of construction and design on food service equipment. To date, it has issued these standards on soda fountain and luncheonette equipment (5) and on general food service equipment (6).

The soda fountain manufacturers are to be complimented on their response to the National Sanitation Foundation meeting in 1948. They immediately set to work and drew up what they felt were reasonable and necessary designs for their type of equipment. It is their report almost to the letter which has been accepted by the National Sanitation Foundation for its final standards. Equipment made to these standards may bear the seal of the National Sanitation Foundation, and it is hoped will be considered acceptable by all health departments.

Actually, this program will relieve health departments of a great deal of work in their own localities as well as make it feasible for purchasers to obtain food service equipment which is considered most cleanable. Dietitians the country over should rejoice at the promulgation of these standards because, by demanding the seal of approval, they will automatically obtain equipment which has been properly designed for ease of cleaning.

SUMMARY

Generally speaking, institutions and particularly hospitals select the finest food money can buy. Usually they have a low turnover of personnel. Yet, careful analysis will point out that they are confronted with the problems discussed. Food sanitation is something you must live 24 hr. a day if you are to do the job others expect of you and take for granted you are doing. Since foods may affect even you and me to the point that we may or may not reach our three score and ten, we bear the tremendous responsibility of seeing that every practical precaution is taken to serve clean, safe, and wholesome food. We must do all we can to improve the nutrition of the people we serve and at the same time serve them safe foods.

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Standards for Sauces

Nine rules for sauces were given by Professor Myrtle H. Ericson, Cornell University School of Hotel Administration, at the Kansas Food Institute held recently at the University of Kansas. These rules, as reported in the April issue of *Institutions Magazine*, are:

(a) Harmony of sauces should be obtained: a game stock for a game sauce or soup, fish stock for fish, fowl for fowl, beef for beef, vegetable for vegetable, fungus for fungus, etc.

(b) The sauce should be light and smooth with a velvety texture and fluidity of body.

(c) The sauce should have a bouquet, as in wine—subtle and well blended.

(d) The sauce should have a colorful, glossy appearance to please the eye and to enhance the food being served.

(e) There should be a complete absence of any sight or taste of fat.

(f) A sauce should be appetizing and inviting in its looks.

(g) A sauce should seem vaguely in motion even after it has been poured over the food for which it has been prepared.

(h) A sauce must never, by any chance, seem cold, set, solid, greasy, lumpy, or pasty.

(i) A sauce should literally "pick-up" a dish and carry it to the heights of the extraordinary—such as a dash of paprika on top of a pale sauce, a pinch of herb, or a snip of chives.

Supervisory Training[1]

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IN THIS paper, an attempt will be made to point out three things:

(a) The major areas of supervisory responsibilities and skills.

(b) The advantages of organized training.

(c) Three effective tools which have been used in industry during recent years.

SUPERVISORY RESPONSIBILITIES

First, let us look at the broad responsibilities and skills of any supervisor (Fig. 1). The first area, "technical knowledge," refers to the type of background, formal education, and training a person must have to qualify for a certain job. This will vary greatly, depending on how scientific and involved the job is. The work of a dietitian obviously requires a great deal of formalized education, whereas a production worker in a plant may need relatively little technical knowledge. The same is true in supervising people. The technical knowledge required in some cases would be high, in others, rather low.

The next area on the chart, "methods," is concerned with the way or means of getting a job, any kind of a job—production, service, or sales—done. It also involves the development of new and improved methods.

The third area is that of "management responsibilities." This covers the hundred and one responsibilities of any supervisor to his or her superior and to top management. It involves the knowledge of—and the ability to use—the procedures, policies, rules and regulations, reports, cost control, quality control, safety practices, and so on adopted in an organization.

The responsibility for cost control is one that gives many people trouble—in the shop, in the office, in the hospital, or wherever. Some supervisors think that financial responsibilities will take care of themselves, but cost must be carefully controlled by the supervisor. To do that, he has every right to expect some kind of guidance and training from his organization.

[1] Presented before the Indiana Dietetic Association's 17th Annual Convention.

LEADERSHIP AND TRAINING

Another area is that of "training"—giving instructions, seeing that people do things properly and at the right time and place. The fifth area may be labeled "leadership"—guidance of human effort, the leading of people, and the developing of confidence and friendliness in the people who are being supervised.

There seems to be general agreement in industry and business that these last two areas of the pie

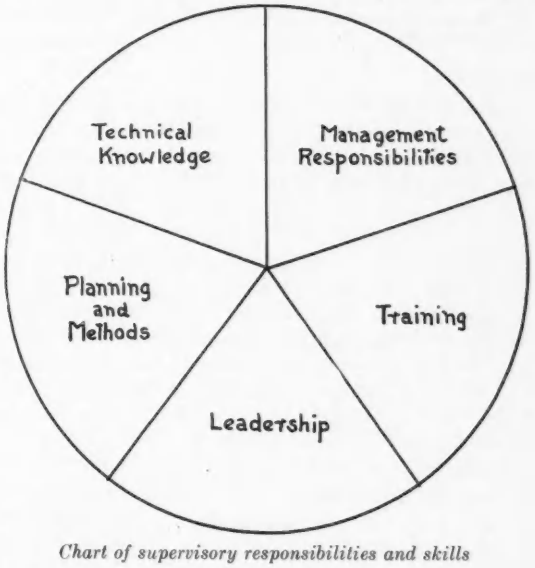
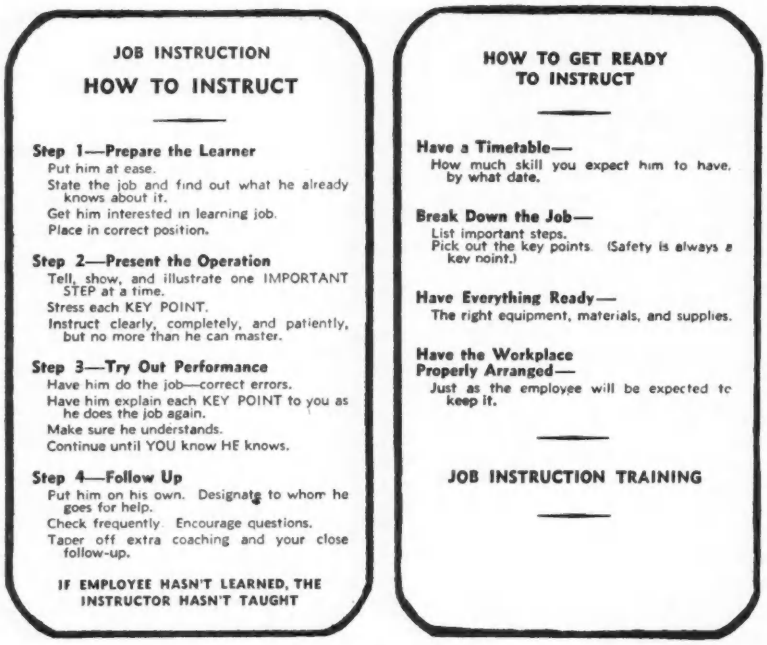


Chart of supervisory responsibilities and skills

chart—leadership and training—are two important, most important skills in supervising people. For example, the selection of officers for the Army and Navy is based first on skill and leadership and second on training ability. Another point that is frequently mentioned is that when employees like their supervisors, nine times out of ten they like their organizations and their jobs. When they don't like their organizations and their jobs, almost invariably you will find, also, that they don't like their supervisors. Because of the importance of skill in "leadership" and "training," these two fields are usually


JOB INSTRUCTION
HOW TO INSTRUCT
Step 1—Prepare the Learner
Put him at ease.
State the job and find out what he already knows about it.
Get him interested in learning job.
Place in correct position.
Step 2—Present the Operation
Tell, show, and illustrate one IMPORTANT STEP at a time.
Stress each KEY POINT.
Instruct clearly, completely, and patiently, but no more than he can master.
Step 3—Try Out Performance
Have him do the job—correct errors.
Have him explain each KEY POINT to you as he does the job again.
Make sure he understands.
Continue until YOU know HE knows.
Step 4—Follow Up
Put him on his own. Designate to whom he goes for help.
Check frequently. Encourage questions.
Taper off extra coaching and your close follow-up.
IF EMPLOYEE HASN'T LEARNED, THE INSTRUCTOR HASN'T TAUGHT
HOW TO GET READY TO INSTRUCT
Have a Timetable—
How much skill you expect him to have, by what date.
Break Down the Job—
List important steps.
Pick out the key points. (Safety is always a key point.)
Have Everything Ready—
The right equipment, materials, and supplies.
Have the Workplace Properly Arranged—
Just as the employee will be expected to keep it.
JOB INSTRUCTION TRAINING

Job Instruction reminder card

emphasized in supervisory training. An effective supervisory training film, "It's Up to You,"[2] points this out. Although the film has a department store setting, it is used in industry because it highlights principles in human relations, leadership, and on-the-job training. In programs where such films are used, the supervisors are asked to observe the films in terms of their own jobs.

The film, "It's Up to You," points out: "The supervisor gets results through people; so your success as a supervisor is going to depend upon what these people do."

ORGANIZED TRAINING

The film emphasizes, too, that good job instruction or training is important. Dale Yoder has said, "Training is inevitable." It is going to take place—whether we like it, whether we do anything about it, or whether it just takes place "catch as catch can."

What, then, are the advantages of organized training? It may be helpful in many ways. It reduces operating costs, improves efficiency, and improves human relations. It reduces complaints and grievances, establishes a basis for promotion and upgrading, and may reduce labor turnover. It may also improve company or organization procedures and practices and the supervisor's interpretation of policies. Organized training will assist in welding all levels of management closer together.

For several years industry has used three tools for supervisors quite successfully—Job Instruction, Job Relations, and the Corrective Interview. At Eli Lilly and Company, in supervisory training programs involving 24 hr. of conference work, we teach our supervisors the principles and uses of these tools. As reminders and helps, the outlines of this training have been summarized on three small, billfold-size cards, printed on both sides. These cards are illustrated.

JOB INSTRUCTION

On the first card, "Job Instruction," one side is concerned with "How to Get Ready to Instruct" and advises the trainer to: (a) have a timetable, (b) break down the job, (c) have everything ready, and (d) have the workplace properly arranged. On the other side of the card is a summary of the industry-proved method of teaching in four steps: (a) prepare the learner, (b) present the operation, (c) try out performance, and (d) follow up. At the bottom is the now well-known, meaningful phrase "If the employee hasn't learned, the instructor hasn't taught." We believe this has "a lot of meat in it."

General Omar Bradley added weight to the importance of instruction when he said, "The finest instruction in the world is wasted on an unreceptive or resistant mind." Thus step number one is very important; put the learner at ease. Interest him in learning the job. It has been said that it is impossible to teach people anything, that the only thing we can do is stimulate them to learn.

JOB RELATIONS

The next reminder card, "Job Relations," repeats the slogan, "A supervisor gets results through people," and points up the foundation of good relations, with four suggestions: (a) let each worker know how he is getting along; (b) give credit when due; (c) tell people in advance about changes that will affect them; and (d) make the best use of each person's ability. People must be treated as individuals.

On the reverse side are suggestions for handling problems. What are we going to try to do? Are we going to try to "save" (improve) the person, fire him, or encourage him to quit? We must decide this first. After the objective has been determined, the following four steps must be taken: (a) get the facts—be sure you have the whole story; (b) weigh and decide—don't jump to conclusions; (c) take action—don't "pass the buck"; and (d) check results—did your action help production?

[2] Produced by Associated Merchandising Corporation. Available from Caravel Films, Inc., 730 Fifth Avenue, New York 19.

THE CORRECTIVE INTERVIEW

The third card deals with "The Corrective Interview." In diagram form, a pattern that a supervisor might follow in handling an interview with an individual is suggested. "Corrective interview" does not necessarily mean that a person is in trouble or that he needs to be corrected. Perhaps it is not a good title, but the intent is to have a planned method or pattern of conducting an interview with an employee. An interview may be conducted to point out the good things that an employee is doing. It also gives the supervisor an opportunity to bring about some kind of corrective action as it is needed, if it is needed. At the left side of the diagram are the five things which should be done before an interview. The supervisor should get the facts, consider probable causes, determine possible actions, select the approach he is going to use, and decide how he is going to handle himself (how does he feel about the individual and the particular problem to be discussed?).

After selecting a satisfactory time and place, the supervisor is ready to conduct the interview. Following the pattern outlined on the card, he may proceed as follows:

(1) State the purpose—"I'd like to talk to you about your job to see if we can help you (improve)." The supervisor immediately moves on.

(2) Good points—"There are some things you are doing well (very well). . ." These points should be discussed.

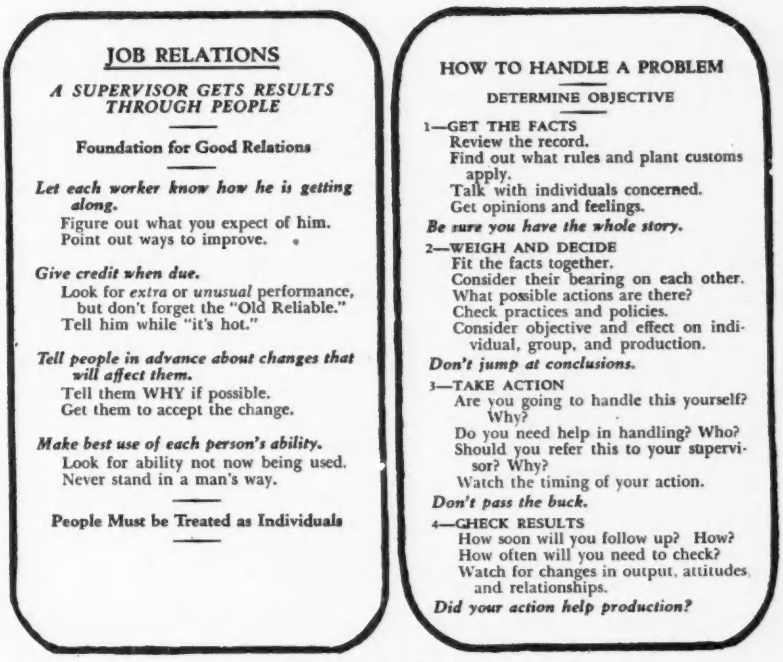
(3) Weak points—"But I'm concerned about these facts. . ." These points should be discussed. Caution should be exercised *never* to use the words "weak points."

(4) Stop to get the employee's opinion. The supervisor wants the employee to talk now, so he says, "Do you think I've interpreted the situation correctly?" If the employee agrees, the supervisor is ready to move on; if the employee disagrees, he may state his point of view.

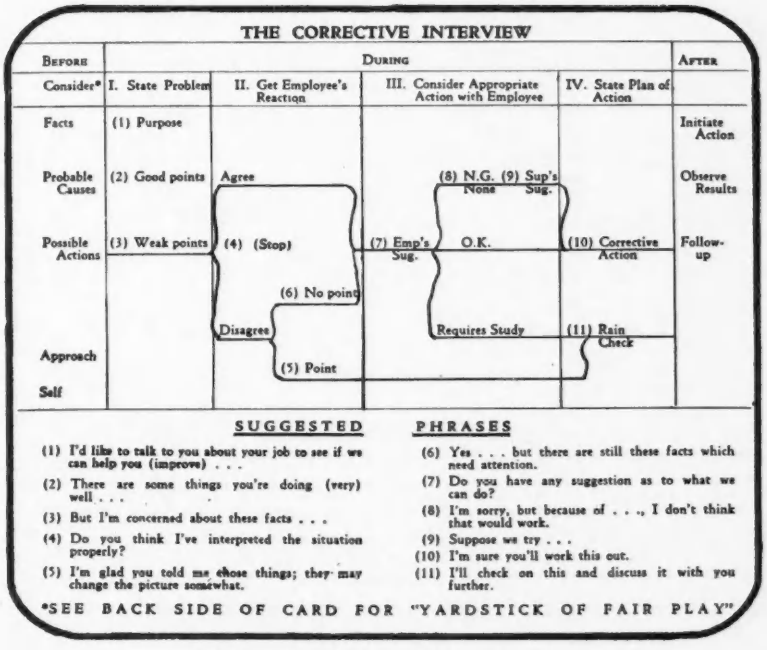
(5) If the employee makes a point, the supervisor may say, "I'm glad you told me these things. They may change the picture somewhat."

(6) If the employee disagrees but fails to make a point, the supervisor may say, "Yes, but there are still these facts which need attention. . ."

(7) Ask for the employee's suggestions—"Do you have any suggestions about what we can do?"


JOB RELATIONS
A SUPERVISOR GETS RESULTS THROUGH PEOPLE
Foundation for Good Relations
Let each worker know how he is getting along.
Figure out what you expect of him.
Point out ways to improve.
Give credit when due.
Look for extra or unusual performance, but don't forget the "Old Reliable."
Tell him while "it's hot."
Tell people in advance about changes that will affect them.
Tell them WHY if possible.
Get them to accept the change.
Make best use of each person's ability.
Look for ability not now being used.
Never stand in a man's way.
People Must be Treated as Individuals
HOW TO HANDLE A PROBLEM
DETERMINE OBJECTIVE
1—GET THE FACTS
Review the record.
Find out what rules and plant customs apply.
Talk with individuals concerned.
Get opinions and feelings.
Be sure you have the whole story.
2—WEIGH AND DECIDE
Fit the facts together.
Consider their bearing on each other.
What possible actions are there?
Check practices and policies.
Consider objective and effect on individual, group, and production.
Don't jump at conclusions.
3—TAKE ACTION
Are you going to handle this yourself? Why?
Do you need help in handling? Who?
Should you refer this to your supervisor? Why?
Watch the timing of your action.
Don't pass the buck.
4—CHECK RESULTS
How soon will you follow up? How?
How often will you need to check?
Watch for changes in output, attitudes, and relationships.
Did your action help production?

Job Relations reminder card


THE CORRECTIVE INTERVIEW
BEFORE
DURING
AFTER
Consider*
I. State Problem
II. Get Employee's Reaction
III. Consider Appropriate Action with Employee
IV. State Plan of Action
Facts
Probable Causes
Possible Actions
Approach
Self
(1) Purpose
(2) Good points
(3) Weak points
Agree
(4) (Stop)
(5) Point
Disagree
(6) No point
(7) Emp's Sug.
O.K.
(8) N.G.
None
(9) Sup's Sug.
Requires Study
(10) Corrective Action
(11) Rain Check
Initiate Action
Observe Results
Follow-up
SUGGESTED PHRASES
(1) I'd like to talk to you about your job to see if we can help you (improve) . . .
(2) There are some things you're doing (very) well . . .
(3) But I'm concerned about these facts . . .
(4) Do you think I've interpreted the situation properly?
(5) I'm glad you told me these things; they may change the picture somewhat.
(6) Yes . . . but there are still these facts which need attention.
(7) Do you have any suggestion as to what we can do?
(8) I'm sorry, but because of . . ., I don't think that would work.
(9) Suppose we try . . .
(10) I'm sure you'll work this out.
(11) I'll check on this and discuss it with you further.
*SEE BACK SIDE OF CARD FOR "YARDSTICK OF FAIR PLAY"

The Corrective Interview reminder card

(8) If the employee's suggestion does not seem to be suitable, the supervisor may say, "I'm sorry, but because of . . ., I don't think that would work."

(9) Make another suggestion or agree with the employee's suggestion for corrective action if it is good.

(10) Corrective action—"I'm sure you'll work this out." Leave the employee with a note of confidence.

(11) Delayed action—"I'll check on this and discuss it with you further."

After the interview has been completed, the supervisor must (a) initiate action, (b) observe results, and (c) follow up.

The back flap of this card on "The Corrective Interview" contains a "Yardstick of Fair Play," which is not illustrated. It presents a test of the accuracy and fairness of evaluation through the following questions:

(a) Has the employee's performance really been superior?

(b) Has superior performance actually been typical of the employee?

(c) Is the employee really better than others who might be considered?

(d) Has the employee been tried out in the more important duties for which he appears qualified—to the extent it has been practical to do so?

A test of the accuracy and fairness of a problem evaluation is also given as follows:

(a) Has the employee's performance really been substandard?

(b) Has substandard performance actually been typical of the employee?

(c) Is the employee's performance or job behavior really worse than that of other employees who are not regarded as problems?

(d) Has the employee had a previous indication of what is wrong, and has he been given a real chance to improve?

SUMMARY

This paper first considered and defined the five major areas of responsibilities and skills required of any supervisor: technical knowledge, methods, management responsibilities, training, and leadership. It was pointed out that a supervisor's success is based on what he or she is able to accomplish through people. The advantages of organized training were covered, and finally, three supervisory tools—Job Instruction, Job Relations, and The Corrective Interview—were discussed.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION

William Stark—1741 (?)—February 23, 1770

William Stark may well be recognized as one of the earliest investigators in human nutrition. In the late eighteenth century, Stark undertook dietary studies upon himself because he considered that it would be "beneficial to mankind if we could show them that a pleasant and varied diet was equally consistent with health as the very spare and simple diet commonly recommended as most conducive to health."

Stark describes twenty-four experiments on himself, each with a different diet. Some diets were continued for a month or more and some for only five or six days. For each experiment he recorded the temperature and state of the weather, exact weight of food and water consumed, his daily body weight, number and weight of stools, and weight of urine excreted. He also recorded the different effects of food on the body: "whether for instance, it agrees or disagrees with the stomach, is more or less nourishing, has the quality of invigorating, or of occasioning laziness and inactivity, if it enlivens or deadens the faculties and if it creates or alloys the several appetites and desires." His first experiment was for thirty-one days on bread and water; in the next, he ate bread, water, and sugar and found that he needed less liquid. Toward the end of this dietary period, he says that the gums of both jaws were red and swollen and bled when pressed.

With nothing but carbohydrate for two months, it is not surprising that Stark showed symptoms of what was probably scurvy. Succeeding experiments used bread and water with other foods added one at a time. Among the added foods were olive oil, milk, roast goose, boiled beef, fat, and veal. The experiments began on July 12, 1769 and continued until February 18, 1770 when he was taken ill and died on February 23, at the age of twenty-nine.

Little is known about William Stark. His experiments he carefully recorded, and they have been published by James Carmichael Smyth. No date is given for Stark's birth. Stark was born in Birmingham, England, of an Irish father and Scottish mother. He was educated at Glasgow and later at Edinburgh where he studied medicine. In 1765 he went to London and continued his medical studies at St. George's Hospital. He took his medical degree at Leyden in 1769 and presented a dissertation on dysentery, after which he returned to London and soon began the dietary studies which ended in his death.

William Stark described himself at the beginning of his experiments on diet as a healthy man, about twenty-nine years of age, six feet high, stoutly made but not corpulent, of a florid complexion, with red hair."

Reference: Smyth, J. C., ed.: The Works of the Late William Stark, M.D., Consisting of Clinical and Anatomical Observations with Experiments, Dietetical and Statical. Revised and Published from His Original Mss. London: J. J. Johnson, 1788.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Amino Acid Intake and Nitrogen Balance of College Women[1]

MARION A. WHARTON[2], Ph.D., DOROTHY TYRRELL, and MARY BROWN PATTON, Ph.D.

Ohio Agricultural Experiment Station, Columbus

THERE has been much discussion of the minimum requirements for protein and the kind and amount needed for optimal nutrition. Hegsted *et al.* (1) have stated in their study on twenty-six adults that the National Research Council's daily recommended allowance could, if necessary, be reduced to 50 gm. and still provide a margin approximately 30 per cent above requirement. McKay and co-workers (2), in a study of nitrogen metabolism of 124 young college women eating freely chosen diets, found from regression data that nitrogen equilibrium for this group might be expected at an intake of 8.69 gm. nitrogen or approximately 54 gm. protein per day. Their findings have been substantiated by Cederquist *et al.* (3). However, among the subjects in two of the studies cited (2, 3) and also in a study by Mertz *et al.* (4), there were subjects who did not reach equilibrium on amounts of protein approaching that of the Recommended Dietary Allowances. Because there are few data relating nitrogen balance to amino acid intake, it seemed desirable to collect more information on this subject.

Samples of food, urine, and feces collected during a period of study of calcium metabolism were used for this study on eighteen young college women. The diets were composed of foods ordinarily eaten by these women and were considered adequate in all nutrients except calcium, of which 600 mg. per day were provided. The protein content varied from 57 to 76 gm. daily. The nitrogen balance was studied in terms of surface area and weight in order to determine the effect of varying levels of intake. The intakes of ten amino acids were studied in terms of body weight to determine whether they might be limiting factors in the utilization of nitrogen.

[1] Approved for publication by the Ohio Agricultural Experiment Station as Journal Article No. 42-52. Received for publication January 15, 1953.

[2] Present address: School of Home Economics, North Dakota State College, Fargo.

EXPERIMENTAL PROCEDURES

Eighteen college women served as subjects during ninety-nine balance periods in the winters of 1950 and 1951. The women were judged to be in normal health by medical appraisal. Their ages ranged from nineteen to twenty-two years for sixteen of the women; the other two were thirty-eight and forty-one years of age.

A series of diets planned for seven-day periods provided varying levels of protein from common American foods. In Table 1 a typical day's menu is shown. Each food was weighed for each subject. Weighed amounts of sugar and apples *ad libitum* furnished additional calories when appetites required them. The food was sampled, made into a composite representing an aliquot of each day's intake during the seven-day period, and made into a brown digest according to the method of Stearns (5). For amino acid analysis, the food composite was ground in a Waring Blendor, made to volume with distilled water, and a portion was frozen and stored at −20°F. until analyzed.

Total feces for the individual for each period were composited, carmine being used as a marker, and treated as the food composite for nitrogen determination. One-seventh of urine excreted in a 24-hr. period was saved, acidified, made into a weekly composite, and stored until analyzed.

An adjustment period of one week preceded the seven-day collection period in all cases.

The nitrogen content of food, feces and urine was determined by a macro-Kjeldahl method (6), using the factor of 6.25 to convert to total protein.

The amino acids were determined microbiologically. For all amino acids except tryptophan, samples were hydrolyzed with hydrochloric acid in a sealed tube for 6 hr. at 15 lb. pressure. For tryptophan, the samples were hydrolyzed with sodium hydroxide for 15 hr. using cysteine according to the method of Kuiken (7). The amino acid analyses of the hydrolysates were made according to the method

TABLE 1

A typical day's menu

FOOD	AMOUNT
Breakfast	
	gm.
Grapefruit juice	100
Egg	50
White bread	25
Butter	10
Jam	20
Whole milk	100
Sugar	
Coffee	
Noon Meal	
Spaghetti	100
Tomato	100
Butter	13
Ham	50
Lettuce	40
Salad dressing	11
Cracked wheat bread	25
Jelly	20
Apple (raw)	100
Whole milk	190
Evening Meal	
Veal roast	80
Boiled potato	100
Carrots	75
Corn muffin	45
Butter	16
Jam	20
Canned pineapple	50
Lettuce	10
Date torte	80
Lemon sauce	50

of Steele *et al.* (8). The organism *L. mesenteroides* was used for the assay of lysine, histidine, phenylalanine, leucine, isoleucine, valine, and tryptophan; *L. citrovorum* for arginine and methionine; and *Streptococcus faecalis* for threonine. For *Streptococcus faecalis*, the media of Sauberlich and Baumann (9) was used. The lactic acid produced was titrated directly in the assay tubes with 0.02 N sodium hydroxide to a *p*H of 6.8. The end point was determined electrometrically using the procedure of Henderson, Brickson, and Snell (10) with an automatic microburette for measurement of sodium hydroxide. The amount of an amino acid in a sample was determined by interpolation from the standard curve for the amino acid under consideration.

Statistical analysis of data was done under the supervision of Dr. D. R. Whitney, Statistics Laboratory, The Ohio State University. Fisher's "t" test, correcting for the variance due to more than one balance period for each girl in each group, was used to determine the significance of difference of nitrogen balances at different levels of intake. The standard error of the mean was calculated for all averages. The regressions of nitrogen balance per kilogram of body weight on nitrogen intake and that of nitrogen balance per square meter of body surface on intake was determined by the method of least squares (11).

The surface area was read from the Roth metabolimetric chart (12) using the height and weight of the individual.

RESULTS AND DISCUSSION

The diets used in this experiment provided from 123 to 210 mg. nitrogen per kilogram (or 0.77 to 1.31 gm. protein) supplied by various common American foods. The caloric intake ranged from 30 to 47 calories per kilogram of body weight indicating that these women were receiving the caloric intake of a sedentary or moderately active woman. The energy intake was marginal, as the average loss in weight for these women was 3 lb. in eight weeks and only one of the eighteen gained as much as 3 lb. Thus the data presented here on nitrogen metabolism were accompanied by a marginal energy intake.

Table 2 presents the nitrogen intake, nitrogen balance, caloric intake, and the intake of ten amino acids calculated per kilogram of body weight. The caloric intakes were calculated from food tables (13, 14). The 99 balances were divided into three groups. Group I consisted of all subjects receiving less than 160 mg. nitrogen or 1 gm. protein per kilogram of body weight; Group II, those receiving 160 to 179 (less than 180) mg. nitrogen; and Group III, all those receiving more than 180 mg. nitrogen or 1.12 gm. protein per kilogram of body weight. Group I consisted of 31 balances on 10 women; Group II, 36 balances on 8 women; and Group III, 32 balances on 9 women. All dietaries appeared in each group because the variance in the subject's weight was a determining factor in the amount of nitrogen supplied per unit of body weight.

In Group I, the women retained an average of 7.75 mg. nitrogen per kilogram of body weight; Group II, 14.18 mg.; and Group III, 31.95 mg. These differences were tested by the "t" test, correcting for the variance due to more than one balance period for each girl in the group. Group II retained significantly (P.05) more nitrogen than Group I, and Group III more nitrogen than Group II (P.01). Nine of the negative balances occurred when the nitrogen intake was below 160 mg. per kilogram, and five when the intake was between 160 and 177 mg. per kilogram. In Group I, six of the ten girls showed at least one negative balance period; in Group II, three subjects accounted for the five negative balances; and two of these subjects were not in nitrogen balance in Group I. These results would indicate that some young women need more than 1 gm. protein per kilogram of body weight for nitro-

TABLE 2

Average nitrogen intake and balance and amino acid intake for eighteen women during ninety-nine observations

NITROGEN INTAKE	NITROGEN BALANCE	BODY WEIGHT	ENERGY INTAKE*	AMINO ACID INTAKE									
				Arginine	Histidine	Isoleucine	Leucine	Lysine	Methionine	Phenylalanine	Threonine	Tryptophan	Valine
mg./kg.	*mg./kg.*	*kg.*	*calories/kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*	*mg./kg.*
147 ± 1.5†	7.75 ± 2.57	64 ± 0.9	34 ± 0.5	49 ± 0.8	27 ± 0.6	44 ± 0.9	69 ± 1.2	55 ± 0.8	14 ± 0.4	39 ± 0.6	41 ± 0.8	7 ± 0.1	48 ± 0.7
171 ± 0.9	14.18 ± 2.01	58 ± 1.2	38 ± 0.5	58 ± 1.0	30 ± 0.6	50 ± 0.8	79 ± 1.3	64 ± 1.0	16 ± 0.4	45 ± 0.6	46 ± 0.6	8 ± 0.1	55 ± 0.8
194 ± 1.3	31.95 ± 2.72	57 ± 0.9	39 ± 0.6	61 ± 1.0	34 ± 1.0	54 ± 0.7	86 ± 1.4	71 ± 1.0	17 ± 0.5	48 ± 0.4	51 ± 1.1	9 ± 0.2	60 ± 0.6
Rose's (16) minimum requirement for men‡						10.0	15.7	11.4	15.7	15.7	7.1	3.6	11.4

* The caloric intake was calculated from food tables.

† The standard error of the mean.

‡ Calculated to a body weight basis.

gen equilibrium when the caloric intake is marginal for the maintenance of body weight. The average loss in weight during the eight-week period for the seven women who showed negative balances was 4.2 lb. which was greater than the average of 3.0-lb. loss for all women studied. The caloric intake of these women varied from 30 to 40 calories per kilogram with an average of 35. The average energy intake of all subjects was 37 calories with a range of 30 to 47 calories per kilogram of body weight. Leverton and Rhodes (15), however, reported that nitrogen metabolism during weight reduction in young women was similar to that of normal young women. Their caloric intake was much less than in this study, and the average weight loss was approximately 13 lb. in eight weeks.

The intake of amino acids studied did not appear to be a limiting factor in the utilization of nitrogen. In every case the intake of threonine, valine, leucine, isoleucine, lysine, phenylalanine, and tryptophan was much higher than that recommended by Rose (16) for young men when intakes were calculated per kilogram of body weight. Methionine ingestion, however, appeared to be low, but Futrell *et al.* (17) have shown that when a composite of a mixed dietary was hydrolyzed and the amino acid content determined, there were smaller amounts than when the same foods were analyzed separately. They found the greatest discrepancies with lysine, methionine, and tryptophan. They suggested that for methionine the results obtained from a composite hydrolysis should be corrected through multiplication by a factor of 1.5. When this correction is applied to Table 2, there were only four cases where the methionine intake was below Rose's minimum requirement. In these cases, the nitrogen balances were −1.6, +12.5, +24.9, and +46.0 mg. nitrogen per kilogram of body weight, indicating that the methionine intake was not a major factor affecting nitrogen retention in these subjects. No estimation of cystine, which may also have been a source of methionine for these subjects, was made on these dietaries.

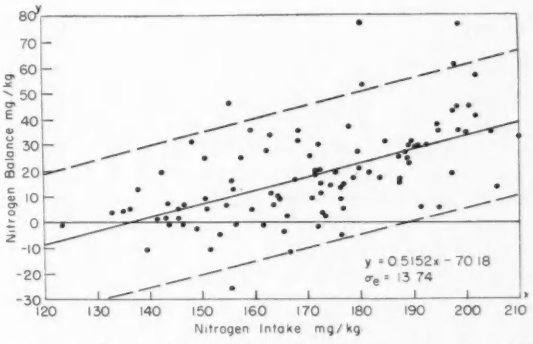


FIG. 1. *Regression of nitrogen balance on intake in milligrams per kilogram.*

Figure 1 presents the regression of nitrogen balance per kilogram of body weight on nitrogen intake. The regression equation is $y = 0.5152x - 70.18$, where x represents the nitrogen intake and y the predicted nitrogen balance. The error of estimation is 13.74 mg. The slope of the line was significant ($P.01$), indicating that the regression was linear for the area studied.

Based on this regression, these young women would be in nitrogen equilibrium on an intake of 136 mg. nitrogen which is equivalent to 0.85 gm. protein per kilogram of body weight, or 47.6 gm. protein for a 56-kg. woman. This is slightly less than McKay's (2) observation of 54 gm. protein for young college women on freely chosen dietaries, and considerably greater than the minimum requirements observed by Hegsted *et al.* (1) and by Leitch and Duckworth (18). However, the work of Hegsted *et al.* and that reviewed by Leitch and Duckworth were for lower nitrogen intakes.

Figure 2 presents the regression of nitrogen balance per square meter of body surface on the nitrogen

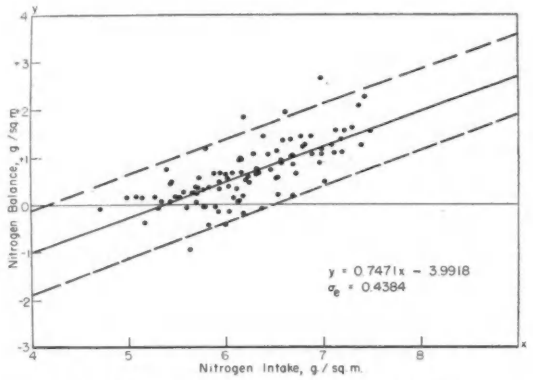


FIG. 2. *Regression of nitrogen balance on intake in grams per square meter.*

intake. The regression equation is y = 0.7471x − 3.9918, where x represents the nitrogen intake and y the predicted nitrogen balance. The error of estimate is 0.4384 gm. The slope of the line was significant (P.01). The "t" value for the slope of the line in Figure 1 was 7.4 and in Figure 2, 10.5, indicating that the nitrogen required for equilibrium was somewhat more closely related to the surface area than to body weight. This is in agreement with the work of Hegsted *et al.* (1).

According to Figure 2, an intake of 5.4 gm. nitrogen per square meter of body surface would be necessary for nitrogen equilibrium. This is much greater than Hegsted's finding (1) of 2.4 gm. when one-third of the protein was supplied by meat. However, the research reported here does not meet the prerequisite for determining minimum requirement in that the level of nitrogen fed was not low enough to consistently produce negative balances. Rather, observations were made in the area of recommended allowances (19). However, in the area studied, the nitrogen retention was in direct relationship to the nitrogen intake.

SUMMARY

Nitrogen balances and intakes of threonine, valine, leucine, isoleucine, lysine, methionine, phenylalanine, tryptophan, arginine, and histidine were studied for ninety-nine balance periods on eighteen young college women. The dietaries were composed of foods common to the American diet and provided from 123 to 210 mg. nitrogen or 0.77 to 1.31 gm. protein per kilogram of body weight.

The data were divided into three groups according to nitrogen intakes. Group I consisted of those receiving less than 160 mg. nitrogen or 1 gm. protein per kilogram of body weight; Group II, those receiving 160 to 179 (less than 180) mg. nitrogen; and Group III, all those receiving more than 180 mg. nitrogen, or 1.12 gm. protein per kilogram of body weight. In Group I, the women retained an average of 7.75 mg. nitrogen per kilogram of body weight; in Group II, 14.18 mg.; and in Group III, 31.95 mg. These averages of nitrogen balances were significantly different. Nine of the fourteen negative balances occurred when the nitrogen intake was below 160 mg. per kilogram and five when the intake was between 160 and 177 mg. There were no negative balances when the intake was above 177 mg. The caloric intakes were those of a sedentary or moderately active woman and were marginal for these women as they lost an average of 3 lb. in weight during the eight-week period.

The intake of the amino acids studied did not appear to be a limiting factor in the utilization of nitrogen. In every case the ingestion of threonine, valine, leucine, isoleucine, lysine, phenylalanine, and tryptophan was much greater than that recommended by Rose for young men. When the methionine intake was corrected for losses due to the hydrolysis of a mixed dietary, it was in most cases greater than Rose's minimum requirements. In the few cases where it was lower, there was no apparent relationship to nitrogen retention.

The regression of the nitrogen balance per kilogram of body weight on nitrogen intake is presented. Based on this regression, these young women would be in nitrogen equilibrium on an intake of 136 mg. nitrogen which is equivalent to 0.85 gm. protein per kilogram of body weight. Thus, by calculation, a 56-kg. woman would need 47.6 gm. protein.

The regression of nitrogen balance per square meter of body surface on the nitrogen intake is also presented. There is some indication that the nitrogen requirement is somewhat more closely related to surface area than to body weight.

The retention of nitrogen by these women increased in direct proportion to intake within the limits of intake studied.

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EMERGENCY FEEDING TRAINING À LA THE ARMY

At Camp Lee, Virginia, the Federal Civil Defense Administration Army Quartermaster Corps jointly conducted from March 4 through 6 a pilot course of instruction in emergency feeding. The following is an excerpt from the report of Dorothy Bovee who attended as the official representative of The American Dietetic Association.

"Though rugged, the course was extremely interesting. The Army showed techniques developed in its normal training program. Not a word or motion was wasted, and the training aids—both visual and demonstration—were effective.

"We had three days of intensive work. On the first, lectures were given on five aspects of establishing outdoor mass feeding facilities utilizing field expedients, including cooking and eating utensils and waste disposal systems in lieu of normal food service equipment. The lectures covered:

Emergency water purification and waste disposal
Prevention of food contamination and food poisoning; personal hygiene and sanitation
Mess layout for mass feeding, selecting, locating, and arranging the kitchen site; construction equipment to be used
Foods to serve, using field expedients; special feeding problems (preparation and service)
Field expedients for mass feeding under disaster conditions for groups of 100 to 500 persons

"In a field trip to the disaster site adjacent to the classroom, we were shown the various types of field expedients and their construction and operation was fully explained. All were in full operation so that their practicality was easy to see. Following the tour, a demonstration was given on techniques for improvising and making quantity cooking utensils and individual eating utensils, utilizing salvaged and scrap materials—mostly tin.

"On the second day, we had a group performance session. We had to do the work ourselves, setting up and constructing cooking facilities and equipment for a 100-person unit, with the time limit that the site had to be established by noon. The facilities constructed were those essential in the first and second phases of disaster—moist heat facilities and ground ovens and grills for dry heat cookery. While one segment of our team made the equipment, the other built the ovens, grills, and installations for moist cooking and sterilizing.

"The next step was to prepare the evening meal. This was the biggest challenge of all, for there were no recipes, no conventional measuring utensils, no pots or pans in which to mix or bake. Our menu of stew with biscuits and coffee was simple, but complex in a sense because of the lack of conventional tools.

"On the third day a panel discussion by the students considered how they might go back to their communities and organize local training. It was agreed that similar instructional programs need to be presented on week-ends and/or after normal work hours in Regional Areas, particularly if such training can be conducted at community levels. This was followed by a discussion and explanation of Army policies with regard to Civil Defense in the mass feeding program."

Editorial

WHO GOVERNS THE A.D.A.?[1]

BEULAH A. HUNZICKER

President, The American Dietetic Association

You are the most important individual in The American Dietetic Association. The fact that one can say, "Oh, I am just a member," points out a lack of realization on the part of some, of the basic role each member plays in the total management of our professional organization. When I hear, "The Executive Board is taking over," I am further convinced that the member does not realize the privileges the organization offers her as a member.

An important privilege and responsibility of each member is the opportunity to take part in her own state association activities and its meetings. Here she has the privilege of lending her support to those principles in which she believes, of expressing herself on matters under discussion, and of bringing to the members her interpretation on other problems. She distinctly has the responsibility of expressing herself in the meeting instead of to a selected group in the corridors after the meeting.

If the material the member poses has national scope, the delegate of the state to the House of Delegates becomes informed. It is the delegate who passes the problem on to the Council representative for that particular area. She, in turn, passes it on to the Council for discussion and consideration.

The Council is composed of the six elected delegates of the House of Delegates and the Speaker of the House, elected by the membership. The four section chairmen and the Speaker-Elect are ex-officio members. The Council exists to give consideration to matters brought to it from the membership by way of the representative body—the House of Delegates. A problem may be placed on the agenda of the House of Delegates for discussion, after which a recommendation is made to return it to the Council for further consideration.

We, who serve as delegates, carry a great responsibility in representing our members. To serve our members fairly and honestly, we must study both sides of a question, must be ready and willing to speak on the floor of the House, must be thoroughly grounded in the objectives of our profession, and must have some vision of the goal we hope our profession can attain in the future. Our wisdom or lack of it influences the trend of the profession.

Recommendations of the House of Delegates are given careful thought by the Council, which may carry them to the Coordinating Cabinet. The Coordinating Cabinet is made up of the members of the Executive Board and the members of the Council. It is truly what its name implies, a body which coordinates the work and thinking of the House of Delegates (via the Council) with that of the Executive Board.

The Coordinating Cabinet makes recommendations to the Executive Board, which is then charged with the responsibility of studying the recommendations from the standpoint of finances, staffing, work volume, and so on. Thus a problem presented at the state meeting by you, a member, reaches the Executive Board for final action.

The Executive Board in the administrative sense manages. You as the member govern. You elect the Nominating Committee which proposes the candidates you in turn elect. Having worked in our professional association as a member, as a delegate, as a board member, and now as president, I am more than ever aware of the important role each member plays in the organization. How each member carries this responsibility will do more to determine the policies of the organization than the action of the Executive Board.

However, there are times when the Executive Board must act to keep the wheels rolling, for democracy acts slowly and members are inclined to let their privileges and responsibilities slip. There may be no recommendation from the membership, and action is imperative. The Board members must use their best judgment. In so doing, each Board member would have liked to have known what the members were thinking.

I have no fear that any Executive Board will ever "take over" as long as the members, individually and through their delegates, exercise the privileges and responsibilities the constitution gives to them, but every member must have an awareness of the part she plays in the profession. Professionalism depends on the growth of the individual member.

[1] Presented at the annual meeting of the Illinois Dietetic Association in Chicago, March 12 and 13, 1953.

Current Comment

RAISING FOOD STANDARDS THROUGH CONSUMER RECIPE TESTING[1]

JANETTE KELLEY

Director, Home Service Department, General Mills, Inc., Minneapolis

Among food companies, there are two accepted methods of appraising food quality: (a) through test panels made up of trained professionals, and (b) through test panels made up of women in their homes—known in professional language as "consumers." However, we'll call them homemakers. Both of these methods are good—and many companies use both—but our experience has proved that the panel of women making tests at home is the most dependable.

Of course, before we can begin to work with women at home, we must have a standard. What is a "standard"? The dictionary calls it, among other things, "a rule for measuring quality." In our field, which is good food for homemakers, our rule, or standard, is the recipe. Do you remember, not so long ago, when a recipe was called a "rule"? I have an eighty-year-old friend who always asks me if I can give her a good "rule" for chiffon cake, refrigerator rolls, or whatever she is interested in at the moment.

How was our rule, or standard, determined? It has been achieved through years of experience, which gave us skill and practical knowledge gained by observing and doing.

MAINTAINING PRODUCT QUALITY

The first requisite for a good recipe is good ingredients. For us, this means first that our flour must be dependable, always uniform. That's why we have one girl in our department who spends all of her time making cakes and bread from samples of flour or mixes that have been sent in by our eighteen mills and our manufacturing plants. She may make, for example, six chiffon cakes from samples of flour sent to us from six different mills in different parts of the country—from California, Montana, New York State, Minnesota, Kentucky, and Kansas. In one test, there may be very little difference between these cakes. Sometimes there might be a little more. There's never much—but often just enough to need correcting, in our judgment. A report goes to all the mills, so they know that the particular run of flour or mix is up to standard. Just as in any activity, there is competition among our mills. Each wants to be the best. Thus, if the report tells them their quality is not "up to snuff," they immediately take steps to improve it. In this way, a woman buying our flour, any place, anywhere, no matter where it's milled, can be sure of getting the same uniform quality. Through these bakings, we know that all our flour is meeting the standard we have set.

In planning this example, I could have chosen bread, rolls, pie, or one of several different kinds of cake. You may be wondering why I chose chiffon cake. This seemed to me a particularly good example. When we developed chiffon cake, it was something entirely new. It had a new texture, new eating quality, and a new method of combining ingredients. And, although cake with liquid shortening had been made before, it had never been done successfully. In fact, chiffon cake established a new category in the cake field—and many state and county fairs now have added chiffon cake as a separate entry in the cake competitions.

ACCEPTABILITY

In the first place, we had to establish a standard for chiffon cake ourselves. Up to then there had been just two types of cake—butter and sponge. Chiffon became the third type—and we might say it was the result of the marriage of butter and sponge-type cakes, for it has the delicacy of an angel food and the richness of a butter cake.

The acceptance of chiffon cake by homemakers was overwhelming, but that was no accident. A year of secret testing went on in our own department. The first test was a blindfold taste-test in competition with an extraordinarily good sponge-type cake. Chiffon won 49 to 1. After that, our staff of twenty-two home economists made thousands of the cakes; one girl, alone, baked 400. Then we asked the homemakers to help us. We visited homes in three cities in different parts of the country—Tulsa, Cincinnati, and Philadelphia—where our home economists watched fifty homemakers in each city bake a chiffon cake. The women served it to their families and gave us a full report. In this way, before going further in testing and promoting chiffon cake, we knew

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 22, 1952.

it was acceptable and would be made by homemakers.

INSURANCE TESTING

In writing a good recipe, after being sure of good ingredients, the next step is developing the skill to put those ingredients together. Everyone knows that the best ingredients in the world won't make a good cake unless the recipe helps make that possible. That's why, some years ago, we began to ask for help from women in their homes. In this way we know what they and their families want, and then in turn we give it to them in a form that is practical and usable. We call this our "Insurance Testing"—insurance for us and insurance for the homemaker, herself.

We often say that recipes are one-tenth inspiration and nine-tenths testing. Of course, every recipe is thoroughly tested first in our own kitchens. But that is just the beginning. It's not enough to know that experienced home economists can be successful with a new recipe. We want to know without question that any homemaker, in any type of home, under any conditions, can be successful, too.

That's why we have Insurance Testing, actual home testing of our recipes by women in all parts of the country—women in prosperous homes; women in simple cottages who must count every penny; women of all ages; brides without experience; women who have cooked for half a lifetime; women in cities, in small towns, on farms; all kinds of women, under all possible conditions. Sixteen hundred women, altogether, help us to help them through Insurance Testing.

This is how it works. After a recipe has gone through complete and thorough testing in our own kitchens, including a final tasting by nonprofessional members of the staff who have never seen the product before, the recipe is sent to six Minneapolis women who try it in their own homes. This is a pilot test, handled entirely by our department for our own information and benefit. The purpose of this small test is not to learn about the end results but about the recipe itself. Is it written in such a way that women can read it easily, understand it, and use it? We must know this before the recipe goes out for further home testing.

Each of the six women in this pilot test fills out a complete report. The information here is vital to us. Did she like the recipe? find it easy to follow . . . or difficult? What suggestions would she make? All of this information is carefully analyzed and then further tests may be made in our kitchens, the recipe rewritten, or it may be ready to go out with no further work.

PERFORMANCE TEST

The next two steps in Insurance Testing are handled by our Market Analysis Department. This way we know there will be no bias or prejudice in favor of any recipe; each will be judged completely on its merits through the homemakers' eyes.

First, the recipe goes to a group of twenty-five Minneapolis women for a performance test. Was it easy to make . . . or complicated? Were any of the ingredients difficult to get? Could it be simplified? If so, what would she suggest? Along with their reports, these women send a sample of the result, so that our home economists can compare the actual result with the homemaker's opinion of her success or failure. Often our judgment and hers are about the same, but sometimes a woman will rate her result just good or fair, when we would judge it excellent. In such cases, we are inclined to think that the homemaker in her own opinion would judge it excellent, but she's modest and afraid that it doesn't quite come up to what we would expect.

This performance test gives another opportunity to improve the recipe, so that we can be even more sure of its complete acceptance by women all over the country. In this case, we can see and taste the results. If they don't meet our standard, we send the recipe back to the kitchen, where we may change the proportion of the ingredients, the mixing, the baking, or the writing of the recipe.

On this performance test with twenty-five Minneapolis women, we not only can see the samples of what they make; we can go out to their homes and watch them make the recipe. When there are failures, we often do this, and we almost always learn something. By doing this, we made a surprising discovery in the case of chiffon cake. Everyone knows that over-beating egg whites is a critical factor in an angel food. However, we had found that stiffly beaten egg whites made a much better chiffon cake. But, to our amazement, the women we watched would not beat them stiff enough to hold the yellow batter. This, of course, resulted in another rewriting of the recipe.

THE CROSS-COUNTRY TEST

Finally the recipe is ready for its trip across the country, where women have a chance to tell us what they think of it. Four hundred of them tried the chiffon cake for us.

This cross-country test is for acceptance. Here we want to know: Did the family like it—if not, why? Is it economical, average, or too expensive? Was it easy to make, average, or too much trouble? Will the homemaker make it again? about how often? And we encourage any added comments the tester cares to make. Here, too, we see samples of the bakings.

Again we have an opportunity to improve our recipe—and consequently the end result. We wrote the chiffon cake recipe seventeen times before we were satisfied that homemakers would get the results we wanted them to have. The critical factor still

The demands of convalescence are high...

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	*EGGNOG	MERITENE MILKSHAKE with whole milk
Protein	12.5 Gm.	15.8 Gm.
Fat	12.6 Gm.	8.0 Gm.
Carbohydrate	17.7 Gm.	25.5 Gm.
Calcium	0.24 Gm.	0.5 Gm.
Phosphorus	0.27 Gm.	0.4 Gm.
Iron	1.5 mg.	4.4 mg.
Vitamin A	843 I.U.	1745 I.U.
Thiamine	0.12 mg.	0.7 mg.
Riboflavin	0.45 mg.	1.6 mg.
Niacin	0.2 mg.	6.4 mg.
Ascorbic Acid	2.0 mg.	26.4 mg.
Vitamin D	30 I.U.	150 I.U.
Calories	233	237

*Eggnog nutritive values from Bowes, A. de P., and Church, C. F.: Food Values of Portions Commonly Used, Philadelphia, College Offset Press, 1951, Ed. 7.

†Based on 25 lb. institutional size can.

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was getting the egg whites beaten stiff enough. You know what habit is—and women for generations had been told not to beat their egg whites stiff. Just how stiff to beat them for chiffon cake wasn't easy to describe in words. The stiffness is adequate if a deep path can be cut through the whites with a rubber scraper. To be sure that women would understand it, we even used little sketches in our first ads showing just how the whites should look.

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THE CUSTOMER CHECKS ON THE EXPERTS[1]

EDITH GRAHAM

Chief, Dietetic Service, The Veterans Administration Medical Teaching Group Hospital, Memphis, Tennessee

The ultimate aim of every hospital dietitian is to assist each patient in making a speedy recovery from his illness. Adventure enters into the problem when the dietitian works toward her goal within the limitations of budget, personnel, equipment, and physical layout at her particular hospital. She must view her problem as a challenge instead of a chore.

There is no better way for a dietitian to further all of her objectives than by serving good food and serving it attractively. When the food is good, patients will more readily accept their diets. When the food is good, doctors, nurses, social workers, and others will respect the dietitian and cooperate with her in managing feeding problems.

Food can be the source of tremendous pleasure or of tragic disappointment. Patients and employees have innumerable opinions about food. They like the dietitians to be interested. Setting up procedures for feeling the food pulse in the hospital is essential if there is to be an understanding and appreciation of the patients' food preferences.

One method of judging food acceptability is through a panel of interested persons—a changing, representative panel. I wish to describe briefly: the reason we started to standardize recipes, the procedure used in judging recipes, the benefits derived from using a changing panel, and the precautions to be taken.

THE STANDARDIZED RECIPE

Standardized recipes are essential if one is to serve irresistible food consistently. A standardized recipe is a recipe which establishes procedures that will make possible the production of high quality food. Standardization is a continuing process; one should never lose interest in standardizing new recipes. And, after being standardized, a recipe must be used with skill and judgment.

REASONS FOR STANDARDIZING

There are seven reasons why we started to standardize recipes in 1949. They are as follows:

(a) To set high standards with respect to taste, appearance, and texture for food items prepared and served to our particular group. In some cases foods were not accepted because the proportion of ingredients, seasoning, or method of cooking was not according to the wishes of the group. Products were sometimes too flat, too salty, too dry, too brown, too pale, too thin, or too thick to suit the taste of our group.

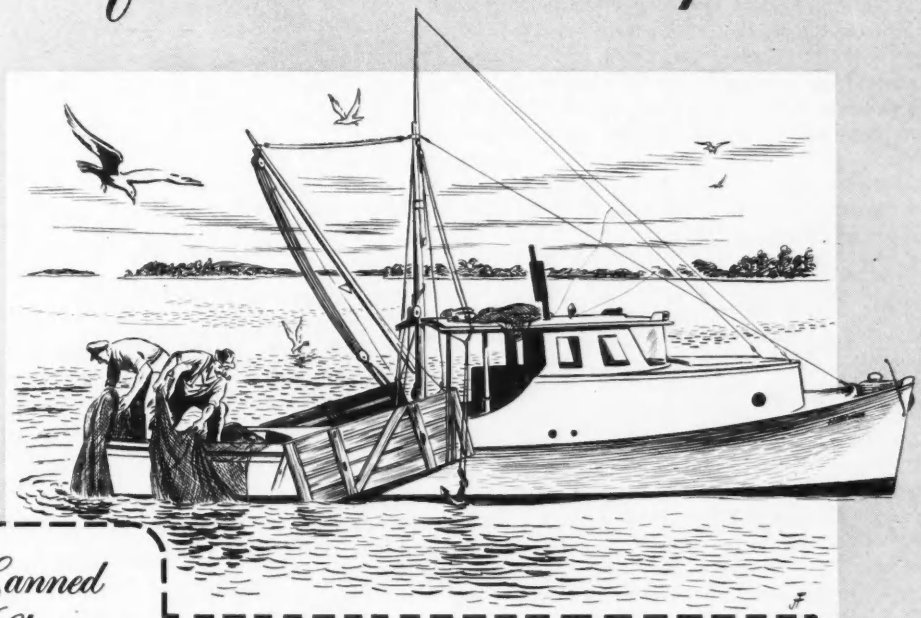
(b) To improve menu planning. Because three dietitians supervised three different kitchens, and a fourth dietitian planned the menus, we did not know how much repetition of ingredients there might be in the meals which contained items such as vegetable stew or creamed ham. Such a simple menu item as creamed ham might turn out to have peas and peppers in it. To avoid "surprises" in ingredients which might result in undesirable repetition, it was imperative that all recipes be standardized.

(c) To make accurate ordering possible. Unless the person who ordered the food to be purchased and the cooks who ordered the food to be prepared in the three kitchens used the same recipe, there was confusion. Too much or too little food might be purchased when the recipes were not standardized.

(d) To control food costs. It was necessary to know the cost of individual items which were used in order to plan menus which were of the proper cost. If the

[1] Presented at the 35th Annual Meeting of The American Dietetic Association in Minneapolis, on October 22, 1952.

For your food file—interesting facts on canned shrimp



Canned Shrimp

Nutrient	Quantity of Nutrient Per Serving	Approximate Percentage of Daily Recommended Allowance*	Approximate Percentage Minimum Daily Requirement**
Carbohydrate (available) (1)	0.82 gm.	—	—
Fat (1)	0.82 gm.	—	—
Protein (1)	17 gm.	25	—
Caloric Value (1)	78 calories	3	—
Calcium (1)	68 mg.	7	9
Phosphorous (1)	160 mg.	—	21
Iron (1)	2.3 mg.	19	23
Vitamin A (2)	37 I.U.	1	1
Thiamine (3)	0.006 mg.	0	1
Riboflavin (4)	0.021 mg.	1	1
Niacin (3)	1.4 mg.	10	—

*Percentage based on Recommended Daily Allowance for physically active man—National Research Council. **Percentage based on Minimum Daily Requirement for adult over 12 years of age—Food and Drug Administration.

1. Food Research 11,391 (1946)
2. J. Nutrition 28,107 (1944)
3. J. Nutrition 28,117 (1944)
4. J. Nutrition 28,123 (1944)

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cost of a recipe seemed excessively high, the ingredients were reviewed and the recipe was studied to determine how it could be made more economical. Surprisingly enough, the recipe for beef hash resulted in a better product even though the amount of beef was reduced by 12 lb. per 100 servings. Other such changes in recipes were made.

(e) To determine the nutritive value of menus. It was impossible to figure the nutritive value of products without knowing the types and amounts of ingredients they contained. By knowing accurately the nutritive value of menu items, it was possible to meet nutritive standards without extravagance and waste.

(f) To interest cooks in improving standards.

(g) To provide a means of determining the preferences of several people regarding recipes.

PROCEDURE USED IN JUDGING RECIPES

The Chief of the Dietetic Service selected two items each week to be tested as they appeared on the regular menu.

One sample of the product to be tested was sent from each of the three kitchens to the Staff Dining Room. A panel was made up of the Chief Nurse, a dietitian from the Ward Food Service Section, the dietetic interns in the Administrative Section, and the Chief of the Dietetic Service. The panel judged the products when they came to the staff dining room to eat.

Last spring we moved the testing area from the staff kitchen to one of the other kitchens in order to have a patient on the panel. A food service supervisor was also added to the panel. All panel members have changed at intervals of one to three months except the Chief of the Dietetic Service and the Chief Nurse.

The panel uses a numerical score sheet to judge the degrees of flavor, appearance, and texture as: excellent, very good, good, fair, or unsatisfactory.

The dietitians and cooks in the units were particularly interested in the comments regarding the recipes. Sometimes each recipe had good points. The ideas of the panel were considered when the best recipe was selected. The "best" recipe was changed, if necessary, and tested again. Sometimes an entirely new recipe was used instead of trying to improve an old one, and sometimes a recipe never proved acceptable enough to add to the file. All recipes were tested for 100 orders in one of the kitchens before they were used for the 1400 who were fed from the three kitchens. New recipes were always tested in small quantities before they were used for everyone.

The dietitians and cooks in the kitchens took such an interest in the standardization program that they requested permission to decide which recipes should be judged each week. This request was granted, and this procedure has proved most satisfactory. After the first year, the dietitian in charge of food production in the three kitchens and the chief cook decided which two recipes should be judged by the panel each week.

During the three years of testing recipes, we judged 312 items, 83 of which met our requirements. They are as follows:

Sauces	3
Bread	4
Cheese dishes	3
Fish	3
Fowl	5
Meat substitutes	6
Meats	19
Potatoes	10
Salads	9
Salad dressing	6
Soups	7
Vegetables	5
Miscellaneous	3

BENEFITS OF PANEL JUDGMENT

The benefits from using the panel have been numerous. It has created an interest in recipes—new and old; it has stimulated the cooks to want to improve their product; it has given us an opportunity to determine local tastes; and it has let personnel and patients know that we are interested in their wishes.

The program has carried itself on its own momentum in a manner that could never have been anticipated. The dietitians have started using panels to judge items on the modified diets.

PRECAUTIONS NEEDED

One must not rely too much on the standardized recipe. There are many other factors which affect food quality. It is necessary to decide whether it is feasible to enlarge a recipe to 500 orders. Perhaps it should never be made up in quantities of more than 100 or 200 orders. Does the standardized recipe help the cook in making his work an art as well as a science? Maybe that extra "pinch" of salt is needed to bring out the best flavor. Have you seen a good cook who did not taste his food? Perhaps the product needs to brown 5 min. more than the recipe specified. Is the recipe so standardized it does not allow cooks to use judgment when ingredients vary, for example, the tenderness of the meat, or the moisture in the potatoes? Are temperatures of fat for deep-fat frying specified as well as oven temperatures or internal temperatures? Are the cooks careful about the time involved in mixing and the time involved in holding the product after it has been prepared? The paper on "Evaluation and Simplification of Recipes" by Pearl Janssen (1) which appeared in the May 1952 JOURNAL has many good suggestions on how to eliminate some of the weaknesses of the standardized recipe.

DRESSING UP THE COMMONPLACE!

TUNA FISH WIGGLE

Approx. 125 - 8 oz. servings

Tuna fish, drained 24 - 13 oz. cans
Noodles .....6 pounds
Tuna Oil ..1-1/2 quarts
Flour ....1-1/2 quarts
Milk, scalded .....3 gallons
Salt ....3 tablespoons
Green peppers, chopped .....1 pint
Onions, chopped .1 pint
Cheese, grated .....2 pounds

Drain tuna, reserve oil for white sauce. Cook noodles in boiling salted water. Boil 10-15 minutes or until tender. Drain. Make a white sauce by mixing the tuna oil and flour; then add scalded milk and salt and cook until slightly thick. Cook the green peppers and onions in salted water till tender. Drain and add to white sauce. Arrange noodles and tuna fish in layers in Lily (#1808S) 8-oz. individual casserole cups. Cover each with white sauce and sprinkle generously with grated cheese. Place filled containers in large shallow baking pan; add hot water to fill pan ⅛" deep. Bake at 375° F. for 20-30 minutes. Serve.

Contributed by Chief Dietitian, Mid-Western Hospital

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Because our panel was not one of trained experts, it was necessary for the dietitians to use the comments of the panel members as guides rather than as the "last word." The dietitians needed to have not only the highest possible food standards, but also a knowledge of and interest in experimental cookery.

SUMMARY

In a hospital, the food must be acceptable and should be the best it is possible to prepare. The use of a representative panel to judge recipes has been one approach to the problem in The Veterans Administration Medical Teaching Group Hospital in Memphis. The appraisal of food quality not only resulted in an improvement in the quality of food served, but also stimulated dietitians and cooks to take a greater interest in the wishes and welfare of the patients. It helped each dietitian to take her full share of responsibility in the care of patients.

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Nutritional Problems of the Future

Two related fields of endeavor have progressed concurrently with nutritional science. One is nutrition education; the other, food technology. Long-range educational efforts have shaped the national diet; and improved methods of purifying, preserving, and transporting foods have enabled producers to meet the altered demand. Today as never before, the public is aware of the significance of good nutrition and receptive to information concerning diet and health. Food science, education, and technology, working hand in hand, have gone far toward eliminating frank deficiency diseases in the United States.

Agricultural practices in this country have undergone a remarkable transition. Nutritional science has improved animal feeds, new pesticides have been introduced, dried skim milk is becoming a familiar article of diet, and "frozen food" is now a national household term. These innovations as well as favorable economic conditions have brought a wider variety of foods, in larger quantity, to a great many people.

There are some indications that subclinical deficiencies remain prevalent—that is, conditions presenting an indefinite clinical picture, but nevertheless an indication of suboptimal health. Such deficiencies are suspected to result in loss of vigor, retarded growth, low resistance to infection, tooth decay, abnormal births, early signs of old age, and other forms of illness and debility. The magnitude of this problem is a subject of few facts and much debate. These facts compel supplementation and scrutiny and may call for intensive action.

Another problem—by all indications, a major health problem today in America—is that of obesity. Moreover, obesity and subclinical dietary deficiencies, probably occurring together in many individuals, may play an important role in the origin of various chronic diseases. Obesity has replaced the vitamin deficiency diseases as the Number 1 nutritional problem in the U. S. An estimated one-fourth of the adults in this country are obese—that is, sufficiently overweight to result in appreciable damage to health; and the incidence may reach 60 per cent in older women. The significance of this is apparent from the fact that mortality rates for the obese are well above average at every age and rise steadily with increasing weight. Obesity is associated with a high incidence of diabetes, cirrhosis of the liver, cardiovascular disease, hernia, gallbladder disease, and certain forms of cancer and arthritis.

A reorientation of nutrition programs may be indicated, with the following objectives: first, control of obesity; second, assessment of nutritional status as an approach to the correction of subclinical deficiencies; and third, elucidation of the role of nutrition in aging and the chronic diseases, such as arteriosclerosis and cancer.

Nutritionists and allied workers, however, cannot confine their vision to these objectives. Today, serious world problems critically involve our own people. We must develop our nutrition program in full recognition of the food problems of other countries.

An abundance of protein has contributed greatly to America's superior nutritional status. In other regions—Asia, Central America, Africa—inadequate protein is a serious dietary defect. In many areas, the problem could be alleviated by substitution of high-protein crops; and where this would not suffice, cereal-potato diets might be adequate by fortification with manufactured nutrients. Modern production methods are progressively reducing the cost of nutrients that are low in a cereal diet, such as lysine and the sulphur amino acids. By these means, the capacity of the world's land to support its populations could be greatly augmented. *—W. H. Sebrell, Jr., Director, National Institutes of Health, Bethesda, Maryland, speaking before the National Food and Nutrition Institute in Washington, D. C., on December 8, 1952.*

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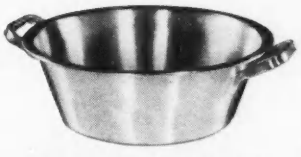

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Student Opinion . . .

Ascorbic Acid and the Common Cold

Several groups of workers have demonstrated in animals marked increase in phagocytic activity in polymorphonuclear leucocytes when the tissues were nearly saturated with ascorbic acid as compared with animals on a lower level of ascorbic acid.

A number of attempts have been made to determine the effect of ascorbic acid on phagocytosis in human subjects suffering from the common cold. Cowan, Diehl, and Baker (1) gave college students 200 mg. ascorbic acid daily and found that they averaged 1.9 colds per year, while the controls averaged 2.2 colds. They reported that statistically, a difference as large as this would arise only three or four times in a hundred. Other workers have reported similar results. Good results were obtained by Markwell (2) in the use of large doses in aborting colds. He found that the sooner ascorbic acid was given after the onset of the cold, the better the effect. A dose of 750 mg. or more was given initially with a further dose of 500 mg. or more 3 or 4 hr. later.

If ascorbic acid is necessary for phagocytic activity, it is reasonable that its greatest benefit in the prevention of colds would occur at the first stage of the infection when a sufficiently rapid increase in phagocytic activity might abort the cold.

Todhunter, Robbins, and McIntosh (3) found that the higher plasmas ascorbic acid level which occurs after administration of ascorbic acid lasts only about 4 hr. even when a 400-mg. dose is given. Consequently, the need for early and repeated administration is obvious if increased phagocytosis is dependent upon this increase in plasma ascorbic acid. Few people understand even this much about the mechanism of the action of ascorbic acid. Certainly most experimental observations on its use in common colds have not started early enough to give the findings much significance.

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—Herbert D. Brody

For the past several years, graduate students at the University of Massachusetts, Amherst, who are working under Dr. Helen S. Mitchell, Dean, School of Home Economics, have been encouraged to write editorial material on various aspects of nutrition. In working out the assignment, it is recommended to the students that they treat some small phase of the subject in an original manner if possible, in order to make it significant and readable. The accompanying editorials are four which were prepared as part of this project for this year.

Vitamin Timing in Pregnancy

Although the increased dietary requirement for vitamins during pregnancy is established, it has perhaps not been sufficiently emphasized that the time of administering the vitamins in relation to the advancement of pregnancy may be of great importance to the health of the infant.

Evidence of this is found in the work of Barrett and Everson (1), who found in rats that concurrently with the advancement of pregnancy, there was an increase in food consumption which resulted in an increased intake of thiamine and riboflavin. Urinary analyses showed little change in concentration of these vitamins, indicating that the increased vitamin intake during late pregnancy was probably being utilized to meet fetal needs.

These authors also found, in experiments on the transfer of vitamins from maternal to fetal tissue, that the concentration of riboflavin in the fetus was very low at the fifteenth day of pregnancy, but at the time of parturition had increased approximately forty-five times. This large increase in fetal riboflavin during the late stages of pregnancy strongly emphasizes the increased riboflavin needs of the mother at this time.

Warkany and Schraffenberger (2) illustrated that riboflavin-deficient female rats produced the greatest number of abnormal young when the deficient ration was fed to the adult animals for about three weeks prior to breeding. A shorter period apparently precluded a sufficient lowering of the body reserves, and longer periods completely prevented live births. It would appear that a diet containing just subminimal amounts of riboflavin allowed for gestation and growth of the fetus, but not for the differentiation and development of certain organs of the fetus.

Nelson, Asling, and Evans (3) found similar results on feeding normal pregnant rats a purified diet deficient in folic acid and containing a folic acid antagonist. When the diet was instituted eleven days after breeding, approximately 95 per cent of the young evidenced such abnormalities as anemia,

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edema, cleft palate, and retarded visceral development. When the diet was instituted up to nine days after breeding, fetal death invariably resulted. When it was begun on the tenth day, approximately 40 per cent of the animals gave birth to litters consisting of a few markedly abnormal young. Delaying of the deficiency until the twelfth or thirteenth day after breeding resulted in all live litters, but with the young having milder degrees of edema and faulty visceral development. Practically no skeletal deformities were observed if the deficiency was delayed until fifteen days after breeding.

The authors stated, in light of the similarity of their results with folic acid-deficient diets to that of the work of Warkany and Schraffenberger with riboflavin-deficient diets, that the timing of the deficiency in producing skeletal abnormalities may be as important as the specific nature of the deficiency.

These few findings serve to emphasize the need for additional work relating the effects of vitamin deficiencies during pregnancy to congenital abnormalities and the time of increase in vitamin requirements.

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—M. A. Steinberg

Ascorbic Acid and Human Stress

Recent work by investigators, such as Sayers and Selye, has focused attention on the relationship between human stress and ascorbic acid metabolism. When the anterior pituitary is activated, it releases the adrenocorticotropic hormone. The hormone, in turn, stimulates the adrenal cortex and speeds up its secretory power and activity. The increased production of the adrenocorticotropic hormone is, as a rule, accompanied by depletion of ascorbic acid.

In man, because of the large stores of ascorbic acid in various tissues, it is assumed that adrenal ascorbic acid concentration is probably restored to about normal values fairly rapidly after depletion caused by acute stress. That this should be the case is indicated by the fact that scurvy can be induced experimentally only after a period of total ascorbic acid deficiency considerably longer than that necessary for the guinea pig. It must be remembered that although the adrenals contain extremely high concentrations of ascorbic acid, actually most of the vitamin is stored in other tissues.

It has been calculated that the body of the normal adult contains approximately 4 gm. ascorbic acid. Probably no more than 1 per cent is contained in the adrenal glands. On this basis, the rapid restoration of normal ascorbic acid values in the adrenals following stress depends not only on the dietary intake, but also on the availability of large stores of ascorbic acid present in other organs. Thus, under stress conditions, these stores would be called upon to supply the amounts necessary for an optimal function of the adrenal cortex.

Almost any stress, if sufficiently severe and prolonged, will cause a lowering of the amount of ascorbic acid in the tissues. This is accompanied by a transitory fall in plasma level and in urinary excretion of ascorbic acid. These manifestations are especially noted after traumatic shock, fractures, and burns and in general after those conditions associated with extensive tissue injury. Increased requirements of ascorbic acid are no doubt due to the additional need when connective tissues are proliferating.

In men exposed to cold environment, blood ascorbic acid level decreased while urinary excretion was increased. Similar findings were observed in men exposed to cold water immersion for 8 min. A lowered rate of ascorbic acid excretion was observed in soldiers subjected to the stress of Arctic travel. In surgical patients, urinary excretion of ascorbic acid markedly decreased during the first few postoperative days. Evidence of increased utilization of ascorbic acid has also been observed in conditions of oxygen deficiency.

In man, prophylactic or therapeutic administration of ascorbic acid heightens resistance to traumatic shock and is a valuable aid in the treatment of burns. However, the ability of men to withstand the damaging effects of repeated exposure to cooling environment could not be appreciably enhanced by administration of dosages of ascorbic acid above requirements for adequate nutrition.

—Sidney G. Spector

Factors Influencing Vitamin Values

Today's student of nutrition has at his disposal numerous compilations showing the vitamin content of practically every food normally consumed in the United States. The table most commonly used is that published by the United States Department of Agriculture in June 1950. Although titled officially as *Composition of Foods—Raw, Processed, Prepared*, it is generally referred to as "Handbook No. 8." In it, a single numerical value is given for each of the more thoroughly studied vitamins, i.e., thiamine, riboflavin, niacin, ascorbic acid, and vitamin A. In using these figures, we too often overlook the fact that they are averages and should be accepted only as such. Due to numerous factors, they are subject to extreme variation.

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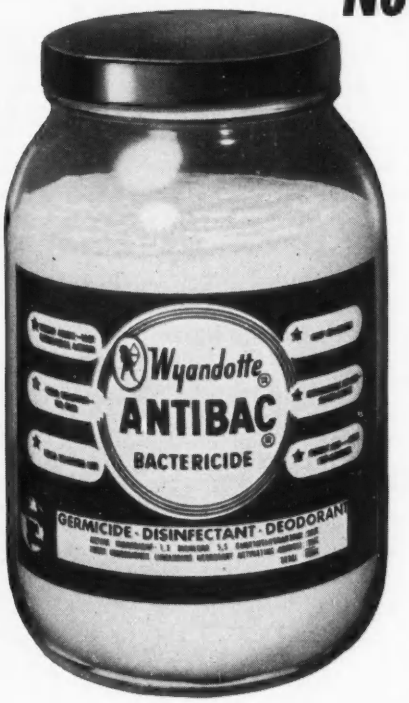

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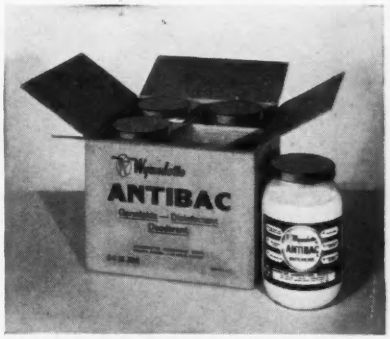

"Control" packaged—4-lb. jars, 4 to a case, easy to handle and store—provide use control and inventory control. ***Antibac* is economical;** you actually use less and it retains its killing power for longer periods in solution or dry form.

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In discussing variation in vitamin content, we must include the influences of such factors as: maturity, variety, growth environment, storage conditions, and methods of processing and cooking. Sherman, in the latest edition of his now classic book, *Chemistry of Food and Nutrition*, has amply reviewed the available literature on the effect of these variables.

There are at least two other factors which are generally overlooked as influencing the vitamin content value.

Without doubt, the most important source of errors can be attributed to the available vitamin assay methods. Although flaws have been pointed out for each of the accepted procedures, the chemical determination for ascorbic acid is probably the most flagrant offender. The method is based on the reducing ability of ascorbic acid, an ability which is also possessed by entirely unrelated substances often found in processed and stored foods. These compounds, grouped together under the name "apparent ascorbic acid," in contrast to true ascorbic acid have absolutely no antiscorbutic activity. A second source of error is introduced by *d*-isoascorbic acid, an isomer of true ascorbic acid, which also possesses reducing power. This substance, used in the food industry for its antioxidant properties, has only one-twentieth the antiscorbutic activity of *l*-ascorbic acid. It can, therefore, readily be seen that the presence of these substances will result in ascorbic acid values in excess of the true physiologic activity.

As though this were not confusing enough, there is present in foods a substance which is not commonly determined, even though it has an antiscorbutic activity equal to that of true ascorbic acid. As a result, numerous reports have underestimated the ascorbic acid content of foods. The compilers of Handbook No. 8 point out that such a situation has influenced their ascorbic acid values. We would place ourselves in a precarious position were we to accept the given values, based on the presumption that the underestimation is counterbalanced by presence of the previously mentioned interfering substances. These errors do not cancel out by occurring in the same foodstuff.

Another factor which should be considered is that the present practice of listing only average values completely obscures the effect of the variables which have been mentioned. Such a condition might be corrected by also indicating ranges of values, thereby making the tables more applicable for use by research workers, and at the same time forewarning those who might unwittingly accept the average figure.

This revision of food composition tables to include range values will not alleviate the errors inherent in the assay procedures, but it can be hoped that continued progress in the improvement of vitamin analysis methods will result in a reduction of the interfering influences.

—*Enio Feliciotti*

Servicemen's Food Preferences

Canned peaches, tossed salads, or pineapple pie will never replace steak in the gustatory regard of the fighting man, but such items rank surprisingly high at the Army dinner table, according to information obtained from attitude surveys conducted by the Quartermaster Corps. Five such surveys were conducted during 1950 and 1951, with over 28,000 enlisted men from all regions of the United States rating nearly four hundred dishes as served in Army messes on a nine-point scale ranging from "dislike extremely" to "like extremely."

Vegetables in general were disliked by more soldiers than were fruits, when the latter were served in salads or in a sauce. Approximately one-third of the test subjects vetoed such vegetables as cabbage, cauliflower, broccoli, Brussels sprouts, carrots, parsnips, rutabaga, beets, asparagus, leafy greens, spinach, squash, eggplant, okra, and hominy. However, tomatoes, potatoes, green peas, green beans, corn, green onions, and lettuce received good ratings and were disliked by only one in seven servicemen. Desserts rated even higher in preference.

Preliminary results have already been put to use by the Food Service Division, Office of The Quartermaster General, in designing the uniform Master Menus which are used by Army and Air Force installations throughout the country. Results will be further analyzed by the Quartermaster Food and Container Institute, Chicago, to relate food preference to background information on the soldier's age, education, length of service in the United States and overseas, location of home, and size of home community.

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THERE ARE certain recipes Carnation makes *quicker*. Many recipes it makes *better*. And some recipes—like this pie—*require* Carnation...no other form of milk will do.

YOU SEE, this pie calls for milk that *whips*. And since Carnation is *double* rich, it whips easily. Double richness is a characteristic your chef won't find in the milk he uses. Nor *heat-refining*...a special process that makes Carnation a superior cooking milk.

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CARNATION LEMON FLUFF PIE

(Makes 9-inch pie)

CRUMB CRUST 2 cups crushed graham crackers
¼ cup melted butter or shortening
2 tablespoons sugar

FILLING
1 package lemon flavored gelatin
½ cup hot water
¼ cup sugar
¼ cup lemon juice
1 cup chilled undiluted Carnation Evaporated Milk
1 teaspoon grated lemon rind

Blend crust ingredients together. Line sides and bottom of 9-inch pie plate, saving ¼ cup crumbs for topping. Combine gelatin, hot water, sugar and 2 tablespoons lemon juice. Whip chilled Carnation with remaining lemon juice about 1 minute. Add cooled gelatin mixture and lemon peel; whip until fluffy (about 2 minutes longer). Pour into crust and chill about 1 hour, or until pie is firm. Garnish as desired.

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Carnation Performs Cooking Miracles Not Possible With Any Other Form of Milk

Current Literature

Contributed by Mildred Bonnell and administrative interns, University of Washington, Seattle: Janette C. Carlsen and Ethel M. Miller, The Johns Hopkins Hospital, Baltimore; Jacqueline Fitzmorris, Dietetic Intern, Veterans Administration Center, Los Angeles; Berdena Rosenow, University of Kansas Medical Center, Kansas City, Kansas; Elizabeth H. Tuft, Wesley Memorial Hospital, Chicago; and the Journal staff

AMERICAN JOURNAL OF DIGESTIVE DISEASES

Vol. 20, March, 1953

The technic of nutritional therapy. M. S. Biskind.—p. 57.

* Preliminary report on the effect of smoking on the ascorbic acid content of whole blood. A. Bourquin and E. Musmanno.—p. 75.

Smoking and Ascorbic Acid. In this experiment with five people, ascorbic acid blood levels were determined during periods of smoking and non-smoking. Ascorbic acid appeared lowered by smoking. Nicotine was added to a sample of whole human blood of known ascorbic acid content. The added nicotine decreased the ascorbic acid of the whole blood about 24 to 31 per cent.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 225, March, 1953

* Thirst as a symptom. J. H. Holmes and A. V. Montgomery.—p. 281.

* Bacteroides infections. Clinical, bacteriological and therapeutic features of fourteen cases. A. M. Fisher and V. A. McKusich.—p. 253.

Thirst as a Symptom. Usually thirst as a symptom is ignored unless it is so pronounced as to be considered polydipsea. It may be important in diagnosis and therapy of several disturbances as: dehydration, cardiac edema, polyurias of endocrine origin, hemorrhage, diseases altering salivary secretion, and emotional disturbances. Salivary secretion rate may be used to distinguish between true thirst and excessive water drinking. The role of the stomach in the satisfaction of thirst is discussed. Fluid imbalance may represent a defect of intake rather than a defect in secretion of fluids.

Bacteroides Infections. There is increasing recognition of instances of Bacteroides infections. Reasons for this rise in incidence and fourteen cases are discussed. There is a wide range in the susceptibility of different strains to antibiotics; aureomycin and terramycin seem to be the most efficient. Carefully planned medical and surgical therapy and early diagnosis markedly reduce the mortality rate.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 43, March, 1953

* Endemic goiter in El Salvador school children. A. Cabezas, T. Pineda, and N. S. Scrimshaw.—p. 265.

Goiter in Latin American Children. Examination of 35,000 school children in El Salvador revealed that endemic goiter is a serious public health problem in that area. The salt used in El Salvador is entirely derived from the sea, but it has an iodine content of only 0.22 parts per 10,000 of salt while the quantity recommended for the prevention of endemic goiter is 1 part per 10,000. Vitamin A deficiency has been reported to increase the amount of endemic goiter, and the diets in the country generally contain inadequate amounts of that substance. Excessive calcium is known to increase the body's requirement for iodine, but the calcium content of the diet is relatively low there. It is concluded that all salt for human consumption in El Salvador should be iodized.

ANNALS OF INTERNAL MEDICINE

Vol. 38, March, 1953

* Nicotinic acid in the treatment of depression. W. L. Tonge.—p. 551.

Niacin as Therapy for Depression. A series of sixteen patients reported in this paper did not support the claim that niacin may be a useful therapeutic agent in treating depression. While the author does not deny the possibility that the administration of niacin may speed the convalescence in a mild depression in a young person, he suggests that better results can be obtained by simpler means. No benefit was observed in older patients or in those severely depressed.

ARCHIVES OF INTERNAL MEDICINE

Vol. 91, February, 1953

* Liver coma, with particular reference to management. M. M. Karl, R. A. Howell, J. H. Hutchinson, and F. J. Catanzaro.—p. 159.

Management of Liver Coma. Of 58 patients with liver coma, 40 had histories of poor nutrition, 3 of only fair nutrition, and 11 of adequate nutrition. No dietary information was available for 4 patients. Fifty patients gave a history of excessive alcoholic intake and 4 of moderate intake. The nutritional requirements of 100 to 200 gm. protein and 300 to 400 gm. carbohydrate should be supplied by tube feedings, or by the parenteral injection of amino acids, glucose, and electrolytes. Parenteral administration of multiple vitamin supplements and crude liver extract are of value. Whenever possible, ascites may be controlled by a low sodium intake (200 to 600 mg. daily) and mercurial diuretics, rather than by paracentesis.

THE BRITISH JOURNAL OF NUTRITION

Vol. 7, Nos. 1 & 2, 1953

* The effect of cystine and methionine, added separately or together, on the biological value of the proteins of dried skim milk. K. M. Henry and S. K. Kon.—p. 29.

* A social and food survey of the elderly, living alone or as married couples. E. R. Bransby and B. Osborne.—p. 160.

Effect of Added Amino Acids to Milk. The effects of both cystine and methionine on dried skim milk, when added separately or together, were studied for biologic values and true digestibility. In experiments with rats, the addition of 0.2 per cent *dl*-methionine or 0.4 per cent *l*-cystine improved the biologic value of the milk significantly, but no further improvement occurred when they were added together. *L*-cystine alone was less effective when added at the 0.2 per cent level. Rats fed suboptimal amounts of protein achieved normal growth rates when the two amino acids were added to their diets. The true digestibility of the milk proteins was not affected by additions of the amino acids.

Food Habits of the Elderly. A food survey in England of 303 persons over sixty years of age was restricted to those who were living alone or as married couples. Of necessity, many social and economic factors had to be considered in interpreting the nutritional findings, and the consumption of particular foods varied with social, economic, and marital status. Variations in all areas of the survey were more marked for men than for women. Comparison of the caloric intakes found in the survey with those recommended by the Food and Agriculture Organization of the United Nations revealed that the standards are too low.

BRITISH MEDICAL JOURNAL

No. 4808, February 28, 1953

* Electrophoresis of human gastric juice in relation to Castle's intrinsic factor. A. L. Latner and C. C. Ungley.—p. 467.

No. 4809, March 7, 1953

* An assessment of chlorophyll as a deodorant. J. C. Brocklehurst.—p. 541.

Gastric Juice and Castle's Intrinsic Factor. Concentrated human gastric juice was shown to possess intrinsic factor activity when subjected to preparative electrophoresis on filter paper. Several peaks were determined by a protein-staining method. All had vitamin B_{12}-binding activity. The material has

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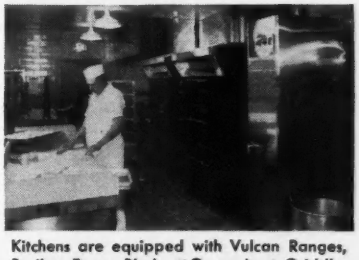

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been shown to contain either a micro-protein or a micropolysaccharide.

Chlorophyll as a Deodorant. Chlorophyll failed to remove the odor of a test solution, or the smell of urine, feces, and sweat in experimental and clinical tests.

THE INDIAN MEDICAL GAZETTE

Vol. 87, April, 1952

* Nutritive value of Biharee cooked food preparations. S. B. Lal and A. R. Mitra.—p. 172.

Vol. 87, May, 1952

* Ascorbic acid in milk and plasma of Bengali women. K. Bagchi.—p. 198.

Vol. 87, August, 1952

* Phrynoderma and some associated changes in blood lipids. K. Rajagopal and S. R. Chowdhury.—p. 350.

Values of Cooked Indian Foods. Recipe and nutrient content of a number of Biharee cooked foods have been worked out, and the difference between the raw and cooked state evaluated. Further work on other dishes is in progress.

Ascorbic Acid in Human Milk. The average concentration of ascorbic acid in milk of twenty-five healthy Bengali women was found to be 6.7 mg. per 100 cc. The correlation between the ascorbic acid value of milk and plasma was significant, and an equation is given to show the relation between these two variants. The possibility of the synthesis of this vitamin in lactation is discussed.

Phrynoderma and Blood Lipids. Phrynoderma, the name given to a hyperkeratosis occurring in malnourished individuals, was at first attributed to vitamin A deficiency, but it is now thought to be connected with fat metabolism. Serum lipid analyses of forty-five normal persons and twenty-four patients with phrynoderma, before and after treatment, showed the average serum values of total lipids, cholesterol, total fatty acids, and iodine number of fatty acids of the phrynoderma patients to be lower than those of normal subjects. Oral administration of ¾ oz. raw linseed oil per day to the phrynoderma cases resulted in improvement in two weeks, and cure in four to twenty-four weeks. Simultaneously with the clinical cure, the serum lipid composition tended to rise to the level of normal subjects.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 1, April 1, 1953

* Dietary proteins: their function in health and disease. J. B. Allison.—p. 71.
* Atmospheric odors, their effect on flavors of stored foods. A. Turk, P. J. Messe, and A. Blaskiewicz.—p. 79.

Dietary Proteins. Dietary protein must supply the essential amino acids to meet the anabolic processes associated with body maintenance and growth and the demands of basic catabolism. The rate at which the needs of the anabolic processes can be satisfied may vary with the dietary protein supplied, and there is a limit to the anabolic function of each dietary protein. The increasing of intake above that limit contributes to exogenous catabolism, increasing the excretion of waste products of nitrogen. Nitrogen retention is one of the functions of caloric intake. There is an optimal caloric intake for maximum anabolism, and even a slight reduction increases tissue catabolism. Even at very low caloric intakes, however, the rate of loss of body nitrogen may be reduced by dietary nitrogen.

Flavor Contamination. The rate of flavor contamination of stored food depends on the concentration of odorous vapors in the atmosphere. In storage, this vapor concentration may be controlled by dilution with contaminant-free air or when the storage air is recirculated through activated carbon which absorbs vaporous impurities. The latter alternative is commercially the more practical. Food storage experiments are reported which show that air purification by activated carbon can effectively reduce atmospheric contamination levels in the storage of meat and butter.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 151, March 7, 1953

* Nutrition of athletes. H. L. Upjohn, J. A. Shea, F. J. Stare, and L. Little.—p. 818.

Vol. 151, March 14, 1953

Tribute to Dr. Philip C. Jeans. Council on Foods and Nutrition.—p. 913.

Milk and headaches. Queries and Minor Notes.—p. 966.

Nutrition of Athletes. Unquestionably, proper diet for an athlete is of considerable importance, but many questions arise as to what constitutes a proper diet for one engaged in highly specialized physical activity. This paper attempts to combine the theoretical and empirical viewpoints of the professor of nutrition, the coach, and the athlete for the purpose of arriving at an increased understanding of the subject. Feeding an athlete is basically no different from feeding an average citizen. Weight maintenance is one of the constant problems, and the psychologic aspects of eating are of particular importance. To the extent that athletes actually increase their muscle mass, they have an increased requirement for protein, and their energy needs are considerably higher than those of a moderately sedentary person. The time at which meals should be eaten is another necessary consideration. The training table should encourage its members to eat and like a variety of foods, a principle of good nutrition for everyone.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 201, March, 1953

* A chromatographic investigation of the amino acid constituents of normal urine. W. H. Stein.—p. 45.
* Cholesterol synthesis by liver. III. Its regulation by ingested cholesterol. G. M. Tomkins, H. Sheppard, and I. L. Chaikoff.—p. 137.
* The roles of essential and non-essential amino acids in maintaining liver xanthine oxidase. G. Litwack, J. N. Williams, Jr., and C. A. Elvehjem.—p. 261.
* A study on the relationship between *l*-ascorbic acid and purine metabolism in vivo. P. Feigelson and B. Lines.—p. 267.
* The synthesis of choline and creatine in rats under various dietary conditions. J. A. Stekol, S. Weiss, P. Smith, and K. Weiss.—p. 299.
* A study of the rate of protein synthesis in humans. I. Measurement of the urea pool and urea space. A. San Pietro and D. Rittenberg.—p. 445.
* A study of the rate of protein synthesis in humans. II. Measurement of the metabolic pool and the rate of protein synthesis. A. San Pietro and D. Rittenberg.—p. 457.

Amino Acids of Urine. The recently developed chromatographic technique was used in an investigation of the ninhydrin-positive constituents of normal urine. Aliquots of 24-hr. urine specimens were analyzed in every case. Quantitative values were obtained for taurine, threonine, serine, asparagine, glycine, alanine, aminoadipic acid, cystine, valine, isoleucine, leucine, tyrosine, phenylalanine, histidine, methylhistidine, and lysine. The virtual absence of aspartic acid, proline, methionine, citrulline, glucosamine, hydroxylysine, ornithine, and arginine was established. Of the approximately 1 gm. per day of amino acids determined, about 70 per cent may be accounted for as the four amino acids taurine, glycine, histidine, and methylhistidine.

Cholesterol Synthesis by the Liver. In the rat, the ingestion of cholesterol for several days depresses the rate at which the liver produces cholesterol. This is a specific inhibition of hepatic cholesterogenesis, not generalized depression of the liver. The lowest level of dietary cholesterol at which inhibition of synthesis was observed was a diet with about 0.5 per cent cholesterol. This level begins to approach that found in constituents of the human diet. A high intake of cholesterol is deleterious to the cardiovascular system. When a diet entirely devoid of cholesterol was fed, the liver had a much greater capacity for cholesterogenesis than did the liver of rats fed 0.5 per cent cholesterol diet. Since the level of plasma cholesterol is very likely determined by cholesterol synthesis in the liver in addition to dietary cholesterol, the question is raised as to whether severe restriction of dietary cholesterol offers any real advantage in the control of arteriosclerosis.

Amino Acids and Xanthine Oxidase. Liver xanthine oxidase activity has been observed to be very sensitive to amino acid changes in the diet. To investigate the contribution of essential amino acids as compared to the non-essential amino acids in maintaining liver xanthine oxidase activity, five groups of weanling rats were maintained on rations of varied amino acid content for twenty-eight days, after which they were sacrificed for liver xanthine oxidase determinations by the manometric method of Axelrod and Elvehjem. It was found that the animals on the non-essential amino acids alone lost weight at a steady rate. When nitrogen was added to the essential amino acid mixture, the resulting growth rate was significantly greater than that of the animals supplied with the essential amino acid mixture alone as the source of nitrogen. The activity of liver homogenates from animals fed the basal essential

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amino acid ration was at least twice that of the animals receiving the nonessential amino acids as the sole nitrogen source.

Ascorbic Acid and Purine Metabolism. Guinea pigs were fed various dosages of ascorbic acid for the purpose of measuring its effect on liver xanthine oxidase activity, the rates of urinary uric acid and allantoin excretion, and the blood uric acid and allantoin levels. It was assumed that should the ascorbic acid inhibit xanthine oxidase *in vivo*, animals receiving high ascorbic acid supplements would produce uric acid and allantoin at a diminished rate. It was found that the ascorbic acid dosage required for significant inhibition of the enzyme is several hundredfold the daily requirement of the animal for the vitamin. Blood levels and rates of excretion of uric acid or allantoin did not reflect the minor enzymatic inhibition procured.

Choline and Creatine Synthesis *in Vivo*. It has been concluded that vitamin B_{12} is concerned in some unknown way in the conversion of glycine to serine. The method by which these carbon atoms are transformed into the methyl groups is also unknown but is presumed to be indirect. These experiments investigated the extent of the incorporation of the carbon of the methyl groups of methionine, betaine, and choline into tissue choline and creatine in the folic acid-deficient or the vitamin B_{12}-deficient rat. Diets were devised for folic acid, vitamin B_{12}, and pantothenic acid deficiency studies. In the folic acid-deficient animal the incorporation of the methyl groups is reduced. However, vitamin B_{12}-deficiency produces no such effect. Pyridoxine deficiency reduces the incorporation of the methyl group into choline and of serine into both moieties of choline. The possible involvement of homocystine or of a related product in the synthesis, and in the utilization of serine for choline and creatine synthesis is indicated. The addition of choline or betaine to a diet free of folic acid increases the growth rate of weanling rats maintained on this diet over that of rats fed on the folic acid-free diet alone. A further finding was that the synthesis of methionine may not be as extensive as is indicated by the growth data.

Rate of Protein Synthesis. I. The rate of excretion of urinary urea is related to the rate of oxidative metabolism of proteins whether of tissue or dietary origin. For determining the total urea nitrogen of the body, the rate of excretion of N^{15}-labeled urea in the urine or the dilution of the labeled urea in the blood can be measured. The total body water in man may also be estimated with N^{15}-labeled urea as the test substance.

Rate of Protein Synthesis. II. A method has been developed by which the absolute rate of protein synthesis in an intact animal can be estimated. It is based on the assumption that a dietary amino acid is either used for protein synthesis or is oxidized and its nitrogen excreted. A mathematical interpretation of the interrelationships between the amino acids and protein metabolism in man is presented, followed by a description of experimental procedures for testing the data. Normal male adults in nitrogen balance, on a diet of their own choosing, were used in the experiment which featured the administration of additional amounts of amino acid. The size of the metabolic pool in the subjects was found to resemble the total amount of free amino acid nitrogen in the body. Although small in size, the pool was found to have a rapid rate of activity. Greater isotope concentration of the metabolic pool caused by the injection of the additional amino acid appeared to be largely dissipated within several hours, after which the principal activity seemed to be the redistribution of amino acids released from the proteins.

JOURNAL OF CLINICAL INVESTIGATION

Vol. 32, March, 1953

* Metabolic and renal studies in chronic potassium depletion resulting from overuse of laxatives. W. B. Schwartz and A. S. Relman.—p. 258.

Chronic Potassium Depletion. This paper presents observations on two otherwise healthy women who, prior to the study, had gradually developed severe potassium depletion and hypokaliemia as a result of chronic diarrhea induced by overuse of laxatives. Both women had approximately one-third of the total normal body potassium, but no significant disturbances in water and electrolyte balance and no overt signs of malnutrition. Spontaneous restoration of potassium balance occurred when laxatives were withheld and normal diet given. The severity of the potassium deficiencies which developed gradually suggest that the rate at which potassium depletion develops is of importance in determining symptomatology. Neither patient had any overt neuromuscular symptoms. Red cell sodium, potassium, and phosphorus concentrations were normal. Renal excretion of potassium was very low, and ability to concentrate urine was impaired in both patients prior to treatment. This was restored to normal after correction of potassium deficit.

JOURNAL OF HOME ECONOMICS

Vol. 45, March, 1953

* Method of determining size and shape requirements of work surface for preparing products for baking. R. Rutherford and M. P. Hood.—p. 158.
* Working together for a better understanding of the nutrition of school children. M. B. Patton, E. S. Eppright, A. L. Marlatt, and M. L. Hathaway.—p. 161.
* Menu patterns in the Delta cotton area. D. Dickins and B. V. Gillaspie.—p. 169.
* Roles of laundering and wear in deterioration of four types of cotton uniform fabrics. E. L. Phelps, F. P. McLean, M. M. Moore, L. S. Greenwood, J. Very, N. H. Holm, and V. White.—p. 174.

Work Surfaces. This study to determine basic space requirements for work surfaces was designed for the specific activity of mixing products commonly baked in southern farm homes in quantities to serve four, six, eight, and twelve persons. Utensils used were typical of those used by 25 per cent of the families in the area. Mixing techniques were standardized. The work surface was marked in 8-in. module squares and the size and shape of the area could be changed as the study progressed. The number of times each square was used in the mixing procedures was tabulated. Areas most used took three general shapes: rectangular, semicircular, and L-shaped. The space most frequently used proved to be an L-shaped area of 256 sq. in. This method of study is believed to be applicable in determining surface requirements for other household tasks.

Nutrition of School Children. General nutrition and physical development of school children were the main interests of a study relating dietary habits to general health. Four major sources of information were selected: dietary records; physical growth measurements, and when possible, inspection of general physical condition by a physician; laboratory determinations of blood concentrations of hemoglobin, ascorbic acid, carotene, vitamin A, and alkaline phosphatase; and personal information obtained from interviews with the mothers. Methods for collecting food intake records were explored and factors involved in the school lunch were studied. Doctors, dentists, biochemists, and nutritionists found that through cooperation each could give a broader interpretation to the information he collected by relating it to that discovered by the others. Data are now available on approximately 3000 children in the states where the study was carried on and are being analyzed for publication.

Menu Patterns in Delta Area. The number of meals served and the typical menus of Negro and white families, among owners, renters, and sharecroppers in the Delta cotton region were investigated in an attempt to determine if characteristic menu patterns are followed. The menus revealed can aid home economists in working with these and similar groups inasmuch as they indicate which menu items should be stressed in lessons on food preparation, what substitutions can be offered, what the groups consider appropriate foods for the different meals, and what long-range planning can be done to improve general nutrition.

Cotton Uniform Fabrics. Fabrics commonly used for uniforms worn by nurses and dietitians were tested for resistance to the deterioration resulting from laundering and wear. Three uniforms of each fabric—broadcloth, poplin, suiting, and jean—were assigned to each of five subjects. Each garment was worn for one working day, then laundered, with starching, at a commercial laundry. Replicate uniforms of each fabric were given twenty, forty, and sixty days of wear with laundering and compared with the first group on points of weight, thickness, breaking and bursting strength, and elongation under breaking and bursting forces. The detrimental effect of wear was shown to be two or more times as great as that of laundering. Broadcloth was found to place first

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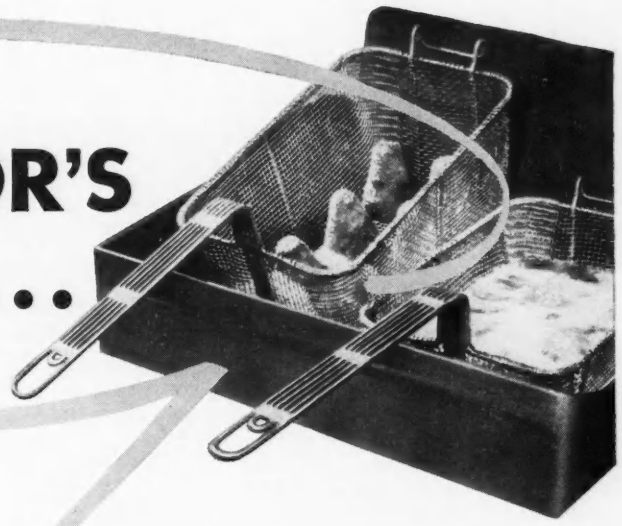

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on the basis of serviceability in the four properties measured, jean last. However, it is to be noted that based on the actual values for the new materials, broadcloth was low in many cases while jean was high.

THE JOURNAL OF NUTRITION

Vol. 49, February, 1953

*Protein, calorie and methionine intakes in relation to nitrogen balance. (A note on the paper by Mertz et al.) E. M. Hegsted.—p. 191.
The feed value of fresh bone. R. H. Udall and C. M McCay.—p. 197.
* Enzymatic liberation of amino acids from different proteins. A. E. Denton and C. A. Elvehjem.—p. 221.
Utilization of amino acids from foods by the rat. I. Methods of testing for lysine. B. S. Schweigert and B. T. Guthneck.—p. 277.
* Utilization of amino acids from foods by the rat. II. Lysine. B. T. Guthneck, B. A. Bennett, and B. S. Schweigert.—p. 289.
* The relative cariogenicity of sucrose when ingested in the solid form and in solution by the albino rat. J. Haldi, W. Wynn, J. H. Shaw, and R. F. Sognnaes.—p. 295.
* Studies on obesity. I. Nutritional obesity in mice. P. F. Fenton and M. T. Dowling.—p. 319.

Nitrogen Balance. In a study concerned with the intake of essential amino acids on self-selected diets, four variables were considered: nitrogen balance, nitrogen intake, calorie intake, and methionine intake. Under the conditions of the study, total nitrogen intake appeared to be by far the most important factor in determining nitrogen balance.

Liberation of Amino Acids. The availability of the essential amino acids for tissue anabolism has been thought to be one of the principal factors in influencing the value of food as a source of protein. For a study of this concept, the rate of liberation of amino acids from different proteins by *in vitro* methods was determined. The results indicate little difference in the rate of liberation of amino acids from beef, casein, and zein when measured chemically, and wide variation by microbiologic measurement. There were differences in the rate of liberation of the amino acids from the three proteins during the pepsin stage of digestion, that of beef being most rapid. Arginine was liberated very rapidly into a microbiologically available form during this stage. However, since it is not known at what rate each amino acid should be liberated for optimal utilization, it is impossible to conclude which of the proteins are hydrolyzed at an optimal rate. Rapid liberation does not appear to mean necessarily greater utilization.

Utilization of Lysine. The utilization of lysine from purified proteins, animal protein products, cereal foods, and legumes was determined by using protein-depleted adult male rats. On an over-all basis, the results showed a greater utilization of lysine from dried eggs and skim milk and from fresh meats than from cereals, legumes, and cooked or processed meats. A greater amount of lysine was shown to have been excreted by the animals fed the cereal foods.

Cariogenicity of Sugar in Solution. Albino rats of the Wistar strain developed no carious lesions when fed entirely by stomach tube a high-sucrose diet, which had previously been shown to be cariogenic when ingested orally. Using rats which had been desalivated for the greater part of the experiment, all the components of this food mixture except sugar were fed by stomach tube and granulated sugar was ingested orally. There developed an appreciable number of carious areas and an appreciable caries score. When sugar was ingested in a 40 per cent aqueous solution, the number of carious areas and the caries score were markedly less than when the same amount of sugar was eaten in solid form. More than half the rats were caries-free. Sugar in solution was, therefore, found in these experiments to be much less cariogenic than granulated sugar.

Obesity. Mice of strains not hereditarily obese before the age of six months were used in studies of the possibility of inducing or preventing obesity by nutritional means alone. For the greater part, the experiments dealt with the development of nutritional obesity by changing the proportions of dietary protein, fat, and carbohydrate. Since body weight alone is not an adequate criterion of obesity, carcass analysis for fat and protein was carried out, because the linear relationship between carcass fat and fat-free weight of the animals offers a more objective indication of the condition. Two of the experimental strains were made obese prior to six months of age by feeding highly purified diets while the others did not so respond on identical diets, indicating that metabolic patterns, and probably endocrine balances, are in part genetically determined. Mice fed high-protein diets eventually attained reasonable body weights but deposited less fat than any other dietary group. High concentrations of lipids were found in the livers of animals which became obese on the purified diets. On the other hand, mice which became obese late in life after having been fed commercial stock ration did not usually develop fatty livers.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 248, March 19, 1953

* Hazards in the treatment of cardiac decompensation. M. D. Altschule.—p. 493.

Treatment of Cardiac Decompensation. One phase of therapy for decompensated cardiac patients is rigid restriction of sodium intake. Skill is needed in planning such diets to make them attractive and to insure that the patient receives required amounts of animal protein and components of the vitamin B complex. Patients who require frequent mercurial diuresis should be advised not to restrict their salt intake excessively, as severe sodium restriction and use of mercurial diuretics can lead to the low sodium syndrome. Extreme restriction of salt is best reserved for patients who can be kept free of edema without mercurial diuresis.

NURSING OUTLOOK

Vol. 1, March, 1953

* Mothers' views on breast feeding. I. S. Wolff.—p. 145.
* Student experience in infants' and children's diet. B. C. Murray.—p. 160.

Views on Breast Feeding. Fifty-six mothers attending a child health conference conducted by the New York City Health Department in 1952 were interviewed by a public health nurse regarding their feelings, thoughts, and experiences with breast or formula feeding or both. The mothers were interviewed informally with questions carefully phrased to promote ease of mind and rapport between subject and questioner. The influence of hospital policy was shown to have had some influence on the mothers' decisions in regard to the type of feeding to adopt, while the mother's cultural background, as revealed in the question pertaining to her own early feeding history, was significant. The report is of interest because of the findings of the last decade that emphasize the psychologic benefits of breast feeding.

Student Nurses Study Child Feeding. A program in child feeding education for nurses at the College of Nursing in the University of Bridgeport was made possible by the close cooperation of the nursing staff, nursing supervisors, dietary staff, and pediatricians. Instead of including the subject in the nurses' freshman and sophomore years, with instruction in normal nutrition and diet therapy, it was introduced during the pediatric assignment in the junior year. The teaching dietitian discussed diet during infancy and childhood with the group, while the chief dietitian provided the students with the basic hospital menu for a period of two weeks. The students adjusted the basic menu to children's needs, and insofar as possible, the dietary department served the meals that the students planned. Each student served one meal a day, observing the children while they were eating. After a week of the program in practice, a round-table discussion was held with the pediatric instructor and the teaching dietitian. The plan appears to be highly successful.

NUTRITION

Vol. 7, Spring, 1953

* Effects of environment on nutrition. M. M. Laurie.—p. 20.
* Social habits and nutrition. S. Holmes.—p. 28.

Environment and Nutrition. In this discussion the effects of both permanent and temporary environments on nutrition are considered. "Permanent" is more accurately described as "long-lasting" and includes such factors as climate and soil, over which, in some areas, man has learned to exercise a certain degree of control. In large portions of the world, however, the human inhabitants are completely dependent on the type of nourishment that can be produced on the immediately surrounding earth surface under the prevailing climatic conditions. Environments more easily subjected to change

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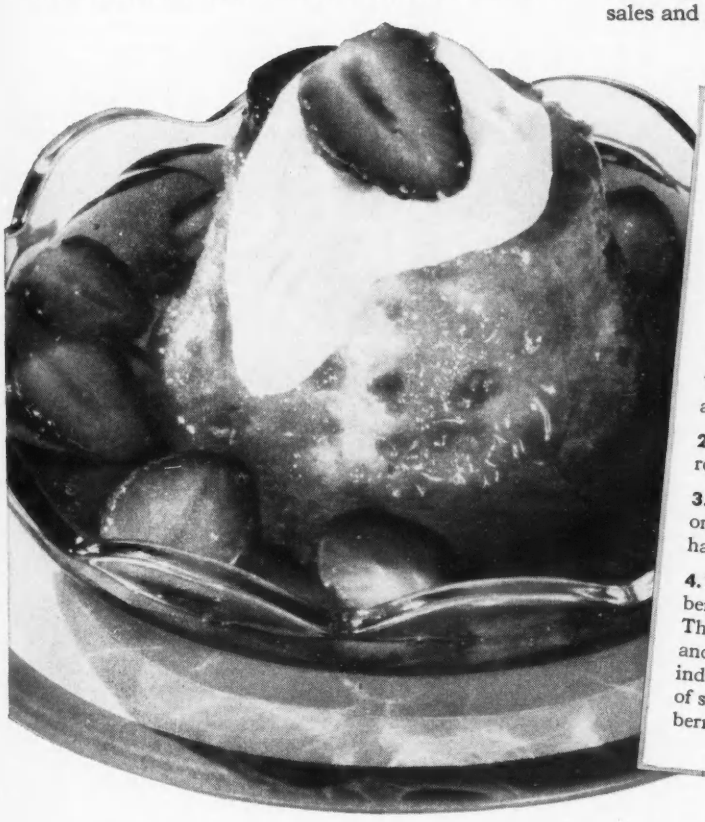

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1½ cups cream, sweetened and whipped

1. Drain strawberries. Measure juice and add water to make 2 qts.; heat.

2. Dissolve Jell-O in hot liquid; cool to room temperature.

3. Place sponge cakes in pans, ½ in. apart, or place in individual serving dishes. Pour half the cooled Jell-O over cakes; chill.

4. To remaining Jell-O, add drained strawberries and chill until slightly thickened. Then pour over shortcakes, covering tops and sides. Chill only until firm. Serve in individual serving dishes with garnish of sweetened whipped cream and strawberries. Makes 24 portions.

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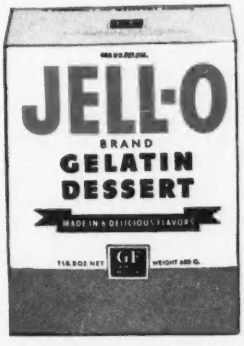

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are home and work situations. The most temporary environment affecting nutrition is that in which a meal is eaten. The importance of a pleasant, relaxed meal time cannot be over-emphasized. In conclusion, the environment, in whatever sense it is interpreted, has a direct effect on nutrition.

Social Habits and Nutrition. Training in social science is beneficial to the dietitian who works among populations with economic and social standards that deviate from those prevailing under conditions of Western civilization. It may be necessary, for instance, to base meal planning on less than the optimal amounts of milk and calcium in order not to deplete further an already badly eroded land area. Nutrition programs must be planned around the foods that can be produced locally, and the use of cheap foods which are rich in nutrients must be encouraged. A nutrition program must be understood by the people for whom it is designed to be effective, and this requires a knowledge of the food preferences of the people. "Westernization" can influence food patterns adversely unless definite planning is done for improving the nutrition in an area.

NUTRITION ABSTRACTS AND REVIEWS

Vol. 23, January, 1953

* The storage of elements in the skeleton. J. Duckworth and R. Hill.—p. 1.

Lability of the Skeleton. The thesis that the mechanism by which mineral matter is lost from the skeleton is one of resorption and not of demineralization has been difficult to demonstrate chemically since the metabolic behavior of bone is different in various parts of the skeleton and even in parts of a single bone. Studies of the effects of pregnancy and lactation on bone structure show that if milk production is relatively high for a particular species, there is loss of calcium and phosphorus from the body, principally from the skeleton. The parathyroid glands are clearly involved in the mechanism for the resorption and repair of bone in pregnancy and lactation. In studying bone changes in egg production, a loss of calcium from the skeleton, even when the diet contained adequate calcium, was found at the beginning of the laying period. Usually, when the skeleton became depleted on a low-calcium diet, egg production ceased or was severely reduced. Many of the other elements stored in the bone are discussed, among them magnesium and sodium, which can be liberated from the skeleton to meet the physiologic needs of soft tissue.

NUTRITION REVIEWS

Vol. 11, March, 1953

* Nutrition—past and future. W. H. Sebrell.—p. 65.
* Requirements for niacin and tryptophan in man.—p. 70.
* Dietary treatment of essential familial xanthomatosis.—p. 72.

Vol. 11, April, 1953

* Changes in body build and body composition during aging.—p. 100.
* Nutrition and pregnancy.—p. 105.

Diet and the metabolic defect in gout.—p. 107.

Prospects in Nutrition. There is ample evidence that improved nutrition in countries with a high standard of living has favorably influenced growth, and it can no longer be assumed that nutrition and genetics are not related. In the United States, gains during this century in health, vigor, stature, and longevity must be attributed in part at least to food science, technology, and education. For example, improved nutrition can take much credit for the decline in maternal and infant mortality. The abundant food supply in the nation contributes to one of the major health problems, that of obesity, which is a nutritional problem. Moreover, obesity and subclinical dietary deficiencies, probably occurring together in many individuals, may play an important role in the origin of various chronic diseases. Dietary inadequacy and defective utilization of nutrients are closely related phenomena. An understanding of the mechanisms of nutrition implies an accurate conception of the complex interrelation of nutrients within the body, which is portrayed in constant studies of proteins and the dietary amino acids. The potentialities and applications of the science of nutrition are at present impossible to predict.

Niacin Requirements. A better knowledge of niacin metabolism in the human body was gained with a demonstration of the *in vivo* conversion of tryptophan to niacin. This should aid in establishing man's niacin requirements, but the problem is complicated by the need for considering the tryptophan content of foods as well. Seven women suffering from psychoneurosis were maintained on diets furnishing small known quantities of niacin and tryptophan, three for long-term studies of 81, 117, and 135 days. In one of the two diets, corn was the staple cereal, and in the other, wheat flour and farina were used. To avoid deficiencies in other vitamins, thiamine, riboflavin, pantothenic acid, and pyridoxine were added. Ascorbic acid was already included. Typical signs of niacin deficiency were noted between the fiftieth and sixtieth days of observation, but all lesions responded suitably to supplementation of the diet with niacinamide. The study suggests that the minimal niacin requirement, under the circumstances produced, is approximately 7 mg. per day.

Dietary Treatment of Xanthomatosis. The effects of a low-fat, low-cholesterol diet on the hypercholesteremia, skin xanthomas, and cardiac function in nine patients with hereditary xanthomatosis have been investigated. The experimental diet contained approximately 20 gm. total fat and 100 mg. cholesterol per day. Determination of the serum cholesterol, total lipids, phospholipids, electrocardiograms, cardiac fluoroscopy, and ballistocardiograms were made at intervals during eight months to seven years on the diet. A significant fall in serum cholesterol was noted after two to four months with a proportionate fall in total lipids and phospholipids. Three of the patients who had tendon lesions continued to have high serum cholesterol values with no regression of the xanthomas. The mechanism by which the diet induced the fall of serum cholesterol is unknown and transposition of these observations to atherosclerosis or degenerative arterial disease is unwarranted.

Body Changes in Aging. Body-build changes in the process of aging can profitably receive further study. The Recommended Dietary Allowances of the National Research Council take sex and activity levels into account but make no adjustments for age. The studies reported here indicate some of the ways in which body tissues and even stature are affected by aging. Nutritionally, the conclusion may be drawn that the average caloric intake during maturity tends to be larger than the actual caloric need and probably should be reduced in a ratio directly proportionate to age.

Nutrition Teaching. The positive relation between nutrition and the outcome of pregnancy was used as the basis of a South American study of the results of nutrition education. Three groups of pregnant women were subjects of the investigation, one serving as control, another receiving dietary supplements, and the third being given nutrition education. The outcome of each pregnancy was recorded as good, regular, or poor, and the physical condition of the children during lactation was observed. Subjects in the control group scored lowest on all counts, although the presentation of the report is not definitive. Clinical examinations and nutrition histories of the subjects prior to and during the study are not included, the type of nutrition education is not specified, and the economic status of the subjects is not revealed.

QUARTERLY BULLETIN OF NORTHWESTERN UNIVERSITY MEDICAL SCHOOL

Vol. 27, Spring, 1953

* Pseudo-glaucoma—a nutritional disease of the optic nerve. D. Vail.—p. 74.

Pseudo-Glaucoma. Investigations of pseudo-glaucoma have yielded significant evidence that arteriosclerosis of the central retinal artery has no effect upon the nerve itself. The damage is caused by sclerosis of the small nutrient vessels which result in poor nutrition of the optic nerve. The continuation of atrophy, cupping, and excavation occasionally seen in individuals whose glaucoma has been successfully relieved by a filtering operation is further clinical evidence of the role played by the nutrient vessels.

SCIENCE

Vol. 117, March 6, 1953

* Removal of thiamin and riboflavin from milk for dietary use. L. F. Adamson.—p. 253.

Removal of Thiamine from Milk. The principal advantages of using the florisil method for removing riboflavin and thiamine from milk, which is to be

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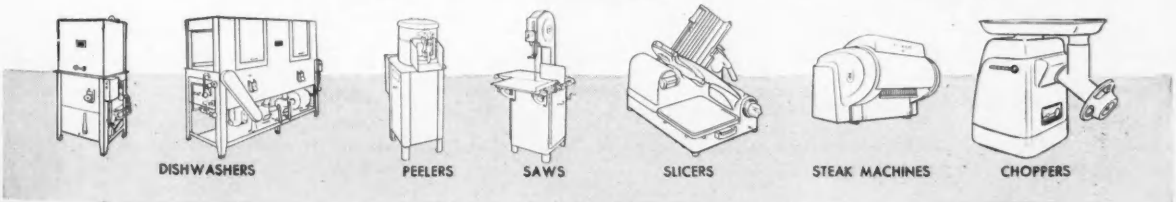

used in experimental diets low in these substances are that the treatment is rapid, the removal is fairly complete, there are no irradiation products, and the taste of the milk is unaltered. The process is described. Only the thiamine, riboflavin, calcium, phosphorus, and nitrogen contents of the treated milk were investigated, and only thiamine and riboflavin were found to be removed to any extent. The possibility that other vitamins, not investigated, are also removed is recognized, and the treated milk should not be assumed to be a source of any nutrient until this assumption is justified by analysis. It is possible to recover and re-use the florisil, a desirable procedure because of the cost of the substance.

SOUTHERN MEDICAL JOURNAL

Vol. 46, March, 1953

Degenerative diseases with nutritional interrelationships. T. D. Spies.—p. 238.

* Diabetes and tuberculosis. A. Reaud.—p. 248.

Diabetes and Tuberculosis. Incidence of tuberculosis among patients with diabetes in the U. S. ranges from 1 to 9.3 per cent. However, there is less frequency of pulmonary tuberculosis in diabetic patients than in the non-diabetic population. There is no observable relationship between the severity of diabetes and the clinical treatment of tuberculosis. In this study standard portions of food were given to all patients whether diabetic or not. A 3000-calorie diet containing 150 gm. protein, 130 gm. fat, and 300 gm. carbohydrate was served. The diabetic patients were controlled on this through the use of insulin. Loss of appetite and weight indicates a reaction of tuberculosis or appearance of complications. The failure to gain weight or loss is a sign of bad prognosis. These two diseases co-exist more frequently in males than females (1.3 to 1) and in whites than in Negroes (1.8 to 1). During this study, therapeutic results did not seem less favorable for the diabetic patients than those recorded for non-diabetic patients. In a high percentage of diabetic patients, pulmonary tuberculosis is detected when it is in a far advanced stage. This fact makes it imperative to take adequate steps to correct this situation, allowing an early recognition of tuberculosis. An X-ray of the chest of all patients with diabetes should be made annually, and immediately if the patient begins to lose weight and appetite without apparent cause, or if the diabetes becomes difficult to control in a patient well stabilized previously.

UNITED STATES ARMED FORCES MEDICAL JOURNAL

Vol. 4, March, 1953

The epidemiology of infectious hepatitis. W. R. Warren.—p. 313.

* The role of thiamine hydrochloride in dentistry: Part III. J. L. E. Bock.—p. 351.

Thiamine as Dental Pain Reliever. In dentistry, thiamine seems to be of value in reducing pain and hypersensitivity when dry sockets occur after extraction of teeth or following gingivectomies. Measurements of muscular sensitivity showed that after the administration of thiamine, the pain thresholds of most subjects were definitely raised. It appears, however, that when the thiamine content of the body is already high, additional thiamine does not raise the threshold. Because thiamine is not a drug, but rather a substance necessary for proper functioning of the body, its use is not likely to produce toxic effects. Any unstored or unutilized excess of thiamine is rapidly excreted by the kidneys. The route of administration depends on the site of desired action and whether it is to be used as a dietary supplement, prophylactic measure, or therapeutic agent.

ADULT LEADERSHIP

Vol. 1, April, 1953

* Evaluating your program (tool kit). Issue Committee and E. C. Lindeman.—p. 13.

* Evaluating goals. Issue Committee.—p. 22.

Uses of Evaluation. The value of evaluation as it can be applied to organizational and small group activities is considered. Why do so many people dislike or fear evaluation? One reason is a lack of realization of its purpose, which has come to be educational rather than judicial. Another is a fear based on the fact that evaluation is often something a superior does to a subordinate. Evaluation, whether of an organization as a whole, of small groups within an organization, or of individuals, is not merely to determine the extent of success. It should be a tool for finding out what is wrong and helping to improve activities. It should be used to improve the performance of all involved in an undertaking. Therefore, it is reasonable that everyone take an active part in evaluation. Steps in evaluation are listed, and a case history of a "sick" organization is related.

Evaluating Goals. Periodic review of goals is the way an organization or group can help to adapt its program to changing needs within itself and in society. Through evaluation of goals, opportunities can be found to change the aims of a group in accordance with its accumulating experience. Not only standards, but also facts are needed in this type of evaluation. A community council's experience illustrates the application of these ideas in an important field of activity. The evaluation committee developed an inventory of cooperation, and evaluation check lists were given to members to use at the end of the season's activities.

AMERICAN RESTAURANT MAGAZINE

Vol. 37, March, 1953

* Schools cut costs with frozen meats.—p. 54.

* More party meal profits. J. A. Cline.—p. 108.

Vol. 37, April, 1953

* More money in meat cookery with modern methods. J. A. Cline.—p. 60.

* Fabricated fish in five sizes for closer portion control.—p. 74.

* It's soufflé salads for spring and summer. L. D. Freeman.—p. 94.

Frozen Meats for Schools. Chicago's Board of Education has recently established specifications for frozen meats to be served in the public schools. Trial operations proved the practicability of using prefabricated frozen meats, which provide ready-to-use portions at lower costs. The system of ordering, purchasing, and delivering the meats is briefly explained.

Party Meal Profits. Party meals can be the most profitable if cooking methods and recipes are controlled to prevent waste. Thoroughly tested standardized recipes which have the yield of number of average servings stated will insure good products and amounts needed. This will eliminate waste and decrease food cost. Tested recipes suggested include turkey loaf, veal chops ambrosia, and ham and corn fritters.

Modern Ways to Cook Meat. Thousands of meat recipes exist; however, there are only three basic types of meat cookery: dry heat, moist heat, and frying. Factors affecting tenderness, shrinkage, and cooking time of meat are discussed. The advantages of low-temperature meat cookery are emphasized. These include more and better-looking portions; uniformly cooked, juicy, tender meat; minimum waste and work; and lower cost per serving.

Fabricated Fish. Sole, flounder, ocean perch, salmon, cod, halibut, haddock, and other species of fish will soon appear in five new fabricated sizes. The fish is skinned and boned, then bonded together at a temperature of −60° F. by molecular cohesion. This bond is not broken by subsequent thawing or cooking. The uniformly-sized portions will provide absolute control of cooking time and appearance; kitchen preparation will be eliminated; the fish cooks in minutes with pre-thawing; and maximum retention of fresh flavor, nutritive value, and texture will prevail. One portion of fish may be cooked at a time without thawing the entire package. Another advantage is elimination of drip loss (liquid run-off when frozen fish are allowed to thaw) which is often as high as 12 per cent of purchased weight.

Soufflé Salads. Flavored gelatin and real mayonnaise are the foundation of soufflé salads, which call for the new and easy fast-frost method. Cooked fish, meat, poultry, vegetables, and fruits can "star" in such a salad. Recipes for the basic mixture and a chicken soufflé salad are given, as well as suggestions for variations and for serving.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 14, March, 1953

* Methods of selecting and developing good supervisors. W. Hertenstein.—p. 45.

* Low temperature meat cookery. A. M. Macfarlane.—p. 48.

Vol. 14, April, 1953

Portion control is the basis of cost control. J. C. Carlsen.—p. 50.

Selecting and Developing Supervisors. It is the prime responsibility of any executive to develop willing and

Choose THE PICKLE for every plate on your menu!

WITH THESE DISHES	SERVE THESE PICKLES
Hamburger and French Fries Canadian Bacon Sandwich Cheese Soufflé Cream of Mushroom Soup—Cottage Cheese Salad Sliced Cold Tongue Sandwich	HEINZ Hamburger Slices
Sliced Cold Meat and Cheese—Cole Slaw Cream of Tomato Soup—Macaroni Salad Corned Beef Hash Bacon, Lettuce and Tomato Sandwich	HEINZ Fresh Cucumber Pickles
Cream of Green Pea Soup—Tuna Salad Sandwich Swiss Cheese Sandwich Club Sandwich Macaroni and Cheese—Buttered Beets Meat Loaf—Vegetable Medley	HEINZ Sweet Pickles Sticks, Cross Cut or Whole
Hot Roast Beef Sandwich Spiced Ham, Swiss Cheese—Potato Salad Barbecued Spareribs—Buttered Broccoli Cream of Chicken Soup—Toasted Peanut Butter Sandwich	HEINZ Kosher Dills Whole or Cross Cut
Broiled Lamb Patties—Escalloped Green Beans Chicken Noodle Soup—Tuna Salad Sandwich Chop Suey over Chow Mein Noodles French Fried Perch—Buttered Spinach	HEINZ Sweet Mixed Pickles
Roast Pork—Browned Potatoes Grilled Cheese Sandwich For interesting variations, add relish to: Hamburger Patties, or Cottage Cheese	HEINZ Fresh Cucumber Relish
Ham Sandwich on Rye Vegetable Soup—Salt Sticks or Hard Roll Chicken Noodle Soup—Sliced Egg and Asparagus Salad Pork Chop and Baked Beans Hot Chicken Sandwich	HEINZ Dill Pickles Process or Genuine
Frankfurter in Toasted Bun Hot Minute Steak Sandwich Chicken Rice Soup—Egg Salad Sandwich Hamburger	HEINZ Hot Dog Relish
Split Pea Soup—Chicken Salad Ham Salad Sandwich Salmon Croquettes—Buttered Carrots	HEINZ Sweet Relish

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able supervisors. Every new employee should be a potential supervisor. Qualifications that should be sought are good health, education, technical knowledge and experience, and ability to direct people. More effective selection of a supervisor from among employees can be accomplished by a group of responsible representatives of management than by a single individual. Supervisory qualities can be spotted by observing the candidate in one or more temporary situations in which he has partial authority. Sound selection of supervisors must be followed by continuous training. The objectives of training are listed and discussed, as are training methods.

Meat-Cooking Revolution. Hundreds of pounds of meat and thousands of dollars have gone to useless waste through high-temperature cookery. Chefs and cooks, however, are so accustomed to this method that it is hard to make them realize that a better, more scientific way exists. Research has proved that cooking meat at lower temperatures yields a better, more nutritious product with less shrinkage—and consequently, lower cost per person. Low temperatures also increase uniformity of cooking, cut down on fuel and work required, and result in easier and more economical carving. A table of internal temperatures for different degrees of "doneness" for large roasts is given, and the importance of a meat thermometer is emphasized.

FOOD ENGINEERING

Vol. 25, March, 1953

* Puffed powder from juice. S. I. Strashun and W. F. Talburt.—p. 59.
* Facts about cold sterilization. Part II. W. M. Urbain.—p. 77.
* Bottlers' sugar standards OK'd. H. E. Korab.—p. 82.
* Detergents effective in removing mold from fruit. R. D. Haynes, H. Harlin, J. O. Mundt, and R. Stokes.—p. 87.
* Tames wild rice. FE Staff.—p. 94.
* Square, light shipper ups their loads and minimizes handling labor. G. Iannelli.—p. 95.
* This improved CO_2 control cuts apple storage costs. F. Kedenburg, Jr.—p. 126.

Powders from Juices. Powders prepared from fruit and vegetable juices, which may compete in quality and perhaps in price with liquid juices, are being developed at the Western Regional Research Laboratory. These powders can be reconstituted almost instantly in ice water. Data, although incomplete, indicate that the powders are quite stable at room temperature. Powders have been successfully developed from orange, lemon, apple, grape, pineapple, and grapefruit juices.

Irradiated Foods. Ionizing radiation still needs research to overcome its drawbacks. Most prominent of its faults is a tendency to affect the flavor and color of some foods. Chemical analyses have revealed other, more subtle changes such as nutrient losses. While little positive information exists now concerning the wholesomeness of irradiated foods, it appears that irradiation should cause at most only minor effects in general wholesomeness. Costs of treatment are still high, but research is expected to reduce them as well as to solve technical problems.

Bottlers' Sugar Standards. Tentative standards for dry granulated sugar have been approved by the executive board of the American Bottlers of Carbonated Beverages. These standards will now make it possible for the bottler to judge the quality of sugar he is using. The new standards are given.

Detergents Remove Fruit Molds. Wash water containing detergent offers an effective, inexpensive means of removing molds from fruit. A table is given showing the relative efficiencies of various mechanical washers and washing techniques in reducing mold counts of strawberries.

Wild Rice. High-priced wild rice is still harvested by hand and processed in special handmade equipment. It is now on grocery shelves as a completely cooked, canned product.

Poultry Shipping Containers. The use of square aluminum tubs for poultry shipping cuts down handling and transportation costs and is more sanitary than the previous use of wooden barrels.

Carbon Dioxide and Apples. Cold diffusers, used to produce desired temperature and humidity in apple storage rooms, effect savings when simultaneously employed to control the room's carbon dioxide content. Deterioration of apples results from a process of respiration in which sugars are oxidized, releasing carbon dioxide, water vapor, and heat. This can be controlled by reducing temperatures, decreasing available oxygen, and increasing the carbon dioxide surrounding the fruit. The process of controlling conditions is outlined.

FOOD SERVICE

Vol. 15, February, 1953

* Report on dishwashing. P. Everhart.—p. 22.

Try these check lists on your dish pantry.—p. 42.

Dishwashing Report. In dishwashing operations there is a wide range in the breakage, type of detergent used, kind of detergent dispensers used, capacity of water heaters, use of water softeners, and wages for dishwashers. According to charts based on questionnaires sent to food services, dishwashing is one of the most expensive operations of the business, but the wages paid are low in comparison to the work done. There are three main brands of detergents being used, and automatic dispensers are favored. Breakage may range from 1 per cent to as much as 40 per cent of the inventory.

HOSPITAL MANAGEMENT

Vol. 75, March, 1953

* The administrator's responsibility in food service. C. E. Kusner.—p. 88.

Administrators and Food Service. Hospital administrators, the author begins, should not burden themselves with direct responsibility for food service. Rather, they should select persons in whom they have sufficient confidence to delegate that responsibility. The professional dietitian's hopes in relation to her administrator are listed as: (a) an honest, clear statement of the organization's policies, and availability for conferences regarding problems; (b) her inclusion as one of the professional team concerned with the care of the patient; (c) realistic budgeting for adequate, trainable food service personnel and for office assistance; and (d) a physical plant which is maintained and improved as carefully as the rest of the hospital. The progress of hospital food service is traced, as is the scope of the dietitian's job which has widened considerably since the profession's birth. The author stresses the importance to dietitians of maturity, of greater selectivity in accepting a position and consequently staying with it longer, and of technical competence.

HOSPITALS

Vol. 27, April, 1953

* Goals and basic requirements in planning for food service. C. D. Gullickson.—p. 91.
* Successful management aids.—p. 94.

Design for Dietary Service. Basic food service requirements were established when the VA hospitals' current construction program was inaugurated. They were: (a) location of all kitchens and preparation areas on or above the ground floor; (b) abundance of natural light and ventilation; (c) walls surfaced to the ceiling with glazed tile for cleanliness and appearance; (d) acoustically treated ceilings; and (e) intercommunication and pneumatic tubes. The planning aim was that the dietetic service resemble a production line with a smooth and even flow of work from the time of back-door delivery to the time of serving patients and personnel. The flow of work in the kitchens is described. It is noted that safe, modern, easily cleaned and maintained equipment is much less than the salary of the person for twenty years (the approximate life of the equipment) whom the equipment replaces.

Administrative Aids. Food Administration Section members of A.D.A. have been compiling successful administrative techniques of dietitians in "A Workshop by Mail." Suggestions were divided into: (a) meeting rising food costs; (b) use of nonprofessional supervisors; (c) working with medical and administrative staff; and (d) good food as a public relations tool. Some of the suggestions which have been received are listed.

THE HOTEL MONTHLY

Vol. 61, April, 1953

* Cooking a la carton. R. E. Preschley.—p. 54.
* Handbook for employees must be read to be effective.—p. 68.

Fabricated Foods. Fabricated and prepared foods assure uniform yield and quality, in addition to savings in time and labor. This uniformity automatically insures recipe standardization, makes it possible to determine portion costs and yields, and thereby reduces left-over food and waste. Beef stew is given as the example; a carton of boneless beef cut for stew is cooked until nearly ten-

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der; a carton of frozen peas and carrots is added; and, if beef pie is desired, the dish is topped with ready-made biscuits. Proper cooking methods are described for beef to be used in stews, and suggestions for quantity service are given. Ideas for garnishes to vary the basic beef stew conclude the article.

Readable Handbook. "Too dull," "difficult to read," and "lifeless" were some of the reactions to the first version of an employee handbook compiled by the management of a carriage-trade resort hotel in West Virginia. Revision and re-styling produced an attractive, easy-to-read booklet which was eagerly accepted by the personnel, old and new, and even requested by outsiders. The success of the handbook has convinced management that its readability has fulfilled its purpose in the personnel relations program.

INSTITUTIONS MAGAZINE

Vol. 32, March, 1953

* Plan for efficiency.—p. 10.

Exploit benefits of food merchandising. J. W. Stokes.—p. 15.

* Way to reduce accident recurrence: review causes. p. 15.

Personnel advice: permit employees margin of error. —p. 15.

* Discusses employee sources, testing, using older workers.—p. 16.

* Tests illustrate effect of odors on stored food.—p. 17.

* Three safeguards for salad preparation.—p. 32.

* Outlines refrigeration needs for food service operations.—p. 40.

* Menu monotony met by planned feeding formula. —p. 46.

* Teach sanitation, cleaning methods in NSSA correspondence course. W. H. Haskell.—p. 56.

* Sound checking system reduces inventory loss.—p. 128.

* Patrons hold key to success in food service operations. S. Hartt.—p. 131.

Kansas Food Institute Report

* MEAT: factors in selection, proper cooking methods.—p. 138.

* SALADS: how to plan for color, health, harmony.—p. 141.

* MENUS: set up for appeal to eye, appetite.—p. 145.

EMPLOYEES: ways to promote profitable relations.—p. 153.

* Better when broiled. A. M. Macfarlane.—p. 182.

* How to select equipment for broiling.—p. 183.

Kitchen-Centered Residence Hall. Duke University's new Men's Graduate Center was literally built around the food service department. Architects delayed designing the structure until kitchen layout had been mapped for maximum efficiency with minimum staff. Fifteen employees serve 30,000 cafeteria and 12,000 coffee shop meals a month. The food service department is illustrated by photographs and a floor plan.

How to Reduce Accident Recurrence. All accidents should be properly evaluated immediately. A good way to do this is by answering a few simple questions such as: Was it his first? Who was at fault? Did he follow directions? Was his work planned? Was he instructed in the use of the equipment?

Today's Personnel Picture. Highlights are given from the fifth annual conference on personnel management held at the University of Illinois. The discussions centered around a review of the current labor market, its characteristics, and sources of employees. Reports on the following subjects were given and are condensed in this article; traits of a tight labor market; developing staff by on-the-job training; ways to use older workers; personnel records as a hidden worker source; and tests as a guide for the interviewer.

Odors Spoil Stored Food. Atmospheric odors may contaminate cold-storage foods where conditions are improperly maintained. These odors may stem from the storage structure itself or its insulation; from organic material absorbed into the structure; or from vapors and gases from the food itself, especially when decay has begun. Cross-contamination of flavor is also a danger when different foods are stored together, particularly from strongly-flavored or decaying substances. The rate of flavor contamination depends on the concentration of foreign odorous vapors in the atmosphere. Elimination of flavor adulteration in a food storage space was found by a taste panel to be equivalent to the storage of food in a clean room with no contamination.

Salad Preparation. The three primary factors to be considered in salad preparation are sanitary handling of foods, efficiency in assembling all equipment and utensils needed, and protecting nutritive value in the foods.

Refrigeration. Food service managers should study their operations to determine the type and amount of refrigeration they need. Requirements are influenced by such factors as the type of restaurant, type of menu, size and seating capacity of the restaurant, and frequency of deliveries. Eleven types of refrigeration are discussed, and suggestions are made for the types needed in various kinds of eating places. The author suggests as a wise procedure the hiring of a local maintenance service to establish a preventive program.

Avoiding Monotony. Repeat-meal monotony is very common among public food services. To relieve this, it is helpful to devise a schedule so that repetitions are avoided. When interest in a certain dish wanes, retire it temporarily. Get patrons to suggest new items. It helps to use color variety among vegetables, salads, and desserts. At holiday times add items that are associated with the holiday.

Sanitation Course. A correspondence course in various phases of sanitation and cleaning procedures is being sponsored by the Institute of Sanitation and Modern Cleaning Methods of the National Sanitary Supply Association. Lessons have such titles as: The History of Sanitation; Bacteriology; Sanitation Ordinances; Food Poisoning; Molds and Yeasts; Washing Dishes, Glasses, and Other Equipment; Sanitation Chemistry; and other cleaning necessities. The author notes that nonmember health departments may obtain the course from an officer of the association.

Checking Reduces Inventory Loss. Regardless of how it happens, inventory shortages are expensive. Many shortages occur through mistakes in the accounting department, which can be eliminated by calling in outside auditors to check all books, by keeping price changes up to date, and by close receiving records. Of course, not all shortages are due to this type of error. If an employee's dishonesty is suspected—and there is no reason to suspect it unless all other possibilities have been explored and rejected—a calm and conscientious follow-up should bring to light any defection within the organization.

Patrons: Key to Success. Patrons, of course, are the most important single factor in the business of serving food. The author lists seven basic types of food service: dining room, tray, catering, counter, cafeteria, cart, and buffet. The patron, she notes, may eat away from home for any of nine reasons, which she discusses: palatable and pleasing nourishment; saving of time; economy; relaxation and pleasure; atmosphere; companionship; business reasons; saving work at home; and absence of cooking facilities at home. The discussion concludes with an emphasis on suiting the type of service to the kind of patrons desired.

Meat Selection and Cookery. Considerations in choosing meat should include insistence on a government inspection stamp, familiarity with grade names, and specifications or standards set up by the food operator himself. Rigid sanitation rules in storage, handling, and preparation of meat are essential. Preparation must be based on a framework of necessary tools and equipment, adequate refrigeration, proper freezing and storage, knowledge of "basics" in meat cookery, and accurate temperature control.

Salads to Suit. Salads should be planned to complement the meal they accompany—light for heavy meals, and vice versa. Salads are important because of their high nutrient content, their "party air" and variety, ease of preparation, and adaptability to left-over foods. Pictorial methods are most effective in teaching salad-making to food service employees. Rules for salad-making are listed.

Menu Magic. Functions of a menu and different types are listed. The many factors influencing menu planning are discussed. Basic and miscellaneous pointers for writing menus, particularly to effect easy reading and increase sales, are given.

Broiling. Not only meat, fish, and poultry are suitable for broiling, but also many appetizers, fruits, vegetables, and desserts—in fact, almost anything but soups, salads, and beverages. Types of meat, fish, and poultry that lend themselves well to broiling, and ways to prepare them for the process, are discussed. Cooking time and temperature recommendations for meat and poultry and eight references conclude the article.

Selecting Broiling Equipment. Five types of broilers are in common use today: the salamander broiler, the combination broiler and griddle, the restaurant range, the counter type broiler, and the rotary cooker. Food service operators should make indi-

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vidual analyses of the broiling equipment they need, through a study of the menu and discussions with the menu maker and the chef or cook. Broilers provide the important advantages of fuel economy, flexibility, speed for fast food production, and cooking of food just as the patron wishes.

THE MODERN HOSPITAL

Vol. 80, April, 1953

* Portion control is the basis of cost control. J. C. Carlsen.—p. 120.

Portion Control: Key to Budget. Four ways are discussed of effecting portion control, the primary factor in establishing an accurate accounting system. They are: (a) purchasing prepackaged or prefabricated foods in desired portion sizes; (b) developing standardized recipes; (c) using standard size containers for serving; and (d) establishing the number of servings to be obtained from canned foods. Each of these practices should be adapted to the needs and economy of the individual institution. Some of the advantages of portion control are: enabling the food manager to plan nutritious menus by specifying the size of portion needed to meet the Recommended Dietary Allowances, providing a basis for standard ordering and serving procedures, and allowing close storekeeping control. Portion standards for beef, veal, vegetables, and fruit are given in tabular form.

PERSONNEL JOURNAL

Vol. 31, March, 1953

* Hospitals need better "customer" relations. R. O. Beckman.—p. 373.

Hospital Goodwill. Employee-patient relations in hospitals are not what they should be, according to the author of this article who is a personnel and training consultant and was himself hospitalized for a week. The hospital staff seemed to him to give no thought about the abnormal mental state of ill persons. The hurried treatment which the author received from nurses and others—i.e., dashing out of the room before he could ask a question—made it impossible for him to determine who was responsible for what. The dietary department also came under his criticism; food arrived at irregular intervals, and no consideration was given to his request for easier-to-chew food or for coffee with meals rather than tea. Questions for hospitals' self-appraisal which can bring out organizational and training needs of the institution conclude the article.

PRACTICAL HOME ECONOMICS

Vol. 31, April, 1953

* Spring cleaning in the lunchroom. M. L. Cronan. —p. 40.

School Lunchroom Clean-Up. Ease of cleaning actually begins in the blueprint planning stage when equipment and structural surfaces for future cleanliness can be specified. The National Sanitation Foundation's code for sanitary equipment is cited as a guide. Actual sanitation and cleaning operations depend on the employees. Training in proper cleaning techniques and specific cleaning assignments are needed if employees are to be expected to assume responsibility for sanitation. The best quality of cleaning supplies and tools are also needed.

RESTAURANT MANAGEMENT

Vol. 72, March, 1953

* How grooved cards give us simple, accurate food control. H. Schneider.—p. 37.
* Modern miracles in fruit and vegetable processing. P. P. Logan.—p. 48.
* Balanced before bedtime. R. L. Holman.—p. 52.
* Garnishes that go well with meats. M. L. Casteen.—p. 58.

Vol. 72, April, 1953

* Lamb—more meat for your money. P. F. Muellet.—p. 51.
* New ways in which to utilize rice. A. Easton.—p. 59.

Cost Control Cards. To control costs, a Cincinnati restaurant chain has installed a Key-sort system by which requisitions are handled and raw materials controlled. The grooved cards are also used for analysis by twenty commodity classifications of the percentage of the sales dollar spent for each. Losses of cash and merchandise appear immediately on the cards, and discrepancies between expenditures in the different stores are noted at once. The procedure is presented in detail.

Fruit and Vegetable Processing. Processing of fruits and vegetables has brought restaurants the means for serving dishes year-round which were formerly confined to a certain season or locale. Examples of processing progress include the boom in citrus fruit concentrates, the new aseptic canning, and increased marketing of quick-frozen and dehydrated foods. The role of chemicals in foods, physicists' tools for improving produce, and packaging strides are also discussed.

Nightly Account Balancing. A Nashville cafeteria approaches the ideal of pin-pointing every cost item at the end of each day. As much of the food as possible is bought on a day-to-day basis. The food buyer deals with the market directly, and all items are followed closely from the storeroom to the customer's table. At the end of the day, the management knows exactly how much profit has been made on the day's operations.

Garnishes with Meats. Fruits may be prepared in many ways as garnishes. They give entrées a distinctive touch that makes them stand out from those offered by operators with less imagination and resourcefulness. Often the best way to get new ideas is to refer to old cookbooks and adapt them to the new processed foods on the market. Although fresh and canned fruits may be served with meats, canned fruits are stressed in this article.

Profits from Lamb. Lamb is the subject of this article, the first of six in which the author will describe a new method of cutting meat which results in at least 15 per cent more yield. He lists the advantages of the new method as well as basic requirements for cutting all meats: proper equipment and tools, safety, sanitation, planning of each meat-cutting job, practicing while learning, record-keeping, and use of a standard portion chart. Photographs and a carcass chart illustrate the steps in cutting lamb. A total breakdown of weights, costs, and portions for lamb is also given. The article concludes with ideas for serving lamb.

New Uses for Rice. Rice's increased popularity seems due to the successful efforts made to shorten its cooking time, increase its palatability, and educate people to use it in a variety of ways. Four dessert recipes using rice are given, and many suggestions for rice combinations are listed. The author then deals with another modern trend—the use of frozen foods. She discusses the controversy over thawing frozen meat before cooking and length of storage of meat. Frozen cooked foods, including meat combinations and baked goods, are considered. It is emphasized that frozen foods should not be thawed and refrozen, thereby destroying texture and flavor.

WHAT'S NEW IN HOME ECONOMICS

Vol. 17, April, 1953, Part I

* Canned foods today.—p. 32.
* Research advances knowledge of meat. R. Staggs. —p. 34.

Canned Foods. More than half a billion cases of food, including 350 products, are packed each year. Canned foods have many factors to recommend them: easy preparation and storage, minimum waste, inexpensiveness in most cases, and so on. Consumers' questions about canned foods concern: (a) new uses; (b) canning as it affects food values; (c) effect of freezing on canned foods; (d) discoloration of foods; and (e) storage. New developments in canned foods include two uncooked products, pressurized cream topping and frozen fruits. The importance of dietetic canned foods has increased year by year, as has the demand for canned meats and fish and strained baby and "junior" foods. A discussion of labeling, grading, and sizes of cans concludes the article.

Meat Research. Meat is typical of the foods which have been greatly improved through research during the last decade. Production studies have resulted in better-quality animals, and comparisons are now being made to determine which types of animals are best to produce from the standpoint of economy. Experimental studies have also resulted in new methods of processing and merchandising meats, and the care and storage of meat have also been developed. Few changes have recently been made in recommended cookery methods for meat, except that the importance of cooking all meat at constant low temperatures is emphasized. Research is in progress to: determine the relation between meat grades and cookery methods; investigate further the defrosting and cooking of frozen meats; and discover a possible relationship between meat structure and palatability factors of cooked meat.

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P-22

News Notes

Speakers at the 36th Annual Meeting. Rapid moves are being made in the checkerboard tactics of filling the spaces for speakers at the sessions of the Los Angeles meeting. Those who journey westward will find much that is intellectual, inspirational, and practical to sustain them through the following year.

Drawing on several years' research on the effects of vitamin A and ascorbic acid in the treatment of tuberculosis as well as other extensive studies related to the disease, Dr. Horace E. Getz, Medical Director, Charles Cook Hastings Home in Altadena, California, will discuss the nutrient needs of tuberculous patients and practical dietary procedures in such institutions. Dr. Getz will be heard at the diet therapy session on Tuesday at 1:30 P.M.

Another guest speaker at that time will be A. R. Kemmerer, Ph.D., Professor of Nutrition and Head of Nutrition Research, Arizona Agricultural Experiment Station. His subject will concern amino acids in arthritis.

Dr. Wilton L. Halverson, Director of Public Health of the State of California, who has traveled widely in the western hemisphere studying health conditions, will discuss "Bilateral Health Programs in Latin America," Wednesday at 10 A.M.

The diet therapy session at 2 o'clock on Wednesday will introduce Dr. John W. Gofman, Division of Medical Physics, Donner Laboratory, University of California, Berkeley. A broad background of intensive studies on cholesterol and lipoproteins will contribute to Dr. Gofman's paper on "The Intake of Excess Fat in Calories in Relation to the Development of Human Atherosclerosis."

Dr. Charles Glen King, Scientific Director of The Nutrition Foundation, Inc., and well known to A.D.A. audiences, will discuss current nutrition research at the Thursday evening session.

An authority in the field of diabetes who is known for his theories and findings on carbohydrate metabolism is Dr. Samuel Soskin, Consultant, Department of Medicine, Cedars of Lebanon Hospital, Beverly Hills. Dr. Soskin, who will be remembered for his work at Michael Reese Hospital in Chicago, will also be heard Thursday evening on "Newer Concepts in the Treatment of the Diabetic Patient."

Margaret Terrell, Professor of Institution Management at the University of Washington, Seattle, and widely recognized for her contributions to the field of food administration, will discuss precosting menus and controlling quality purchasing at 10 A.M. Thursday.

Another westerner by adoption, Clara A. Storvick, Ph.D., Professor of Food and Nutrition, Oregon State College, and the 1952 Borden Award Winner, will speak on Friday at 9:30 A.M. on studies concerning factors in the incidence of dental caries.

Nationally known for her articles on health and nutrition, Jennie Rowntree, Ph.D., Director, Department of Home Economics, University of Washington, will be heard on the subject of teaching nutrition at the 2:30 session on Friday.

For A.D.A. Motorists. Members combining a motor trip with attendance at the 36th Annual Meeting of The American Dietetic Association in Los Angeles, August 25 through 28, will find home like hospitality in the attractive motels of the city. The following are recommended for their relative accessibility to the Auditorium and hotel district, as well as for their excellent accommodations.

Redwood Lodge Motel, 906 South Alvarado, features ample off-street parking and a restaurant next door. Rates are from $5 to $8.50 daily.

Colony Motor Inn, 1148 South Crenshaw Boulevard, with nineteen units, is owner-managed, has telephones in each unit, and pets are permitted. Rates are from $5 to $6 daily.

Buena Lodge, 1802 South La Brea Avenue, is a nine-unit motel with thermostatically controlled heat and tiled baths. Rates are from $4 to $8 daily.

La Brea Motel, 1830 South La Brea Avenue, is modern and attractively furnished with television available. Rates are from $4 to $6 daily.

Mayo Motel, 840 North Figueroa Street, is close to downtown Los Angeles, has tiled baths, vented gas heat, and a telephone in each of the thirty-two units. Rates are from $5 to $9.50 daily.

River Glen Motor Hotel, 2934 Riverside Drive, the most remote of the six motels listed, is about 10 min. from downtown Los Angeles and close to Griffith Park. It has twenty-two attractive, fully carpeted rooms, panelray heat, and radios. Rates are from $4.50 to $6 daily.

All feature European plan accommodations, and all except the Colony Motor Inn and the River Glen Motor Hotel offer housekeeping units as well.

Hawaii Invites You. The Hawaii Dietetic Association has extended an invitation to dietitians attending the 36th Annual Meeting of The American Dietetic Association to visit Hawaii following the national convention. A four-day program of entertainment on the island of Oahu has been planned from Monday, August 31 through Thursday, September 3. The plans are as follows:

Monday, August 31
- Official registration of visitors
- Tour of Dairymen's House of Pa-O-Na Keiki (corral of the little ones), followed by buffet lunch with Arthur Gaeth, news commentator, as speaker

Tuesday, September 1
- Walkatour through downtown Honolulu shops, temples, and other places of interest
- Canoe ride at Outrigger Canoe Club, Waikiki Beach

Wednesday, September 2
- Motor trip around Oahu Island
- Picnic featuring Island foods
- Afternoon tea at a beautiful Island home in Wahiawa

Thursday, September 3
- Hawaii show by Kodak
- Tour of Hawaiian Pineapple Cannery
- Annual banquet and business meeting at the Halekulani Hotel.

Dr. Ohlson Wins Award. Dr. Margaret A. Ohlson, immediate Past-President of A.D.A., recently received the American Dairy Association's Distinguished Service Award along with her associates at Michigan State College for research in developing safe reducing diets. Dr. Dena C. Cederquist accepted the Award in Dr. Ohlson's absence.

Grace Bulman Honored. Grace Bulman, President-Elect, A.D.A., on March 20 was elected to the Board of Directors of the National Health Council at its 33rd Annual Meeting.

General Foods Award. Ethel M. Dietz, VA Hospital, Fargo, North Dakota, was one of the winners in the recent General Foods Corporation institution contest. As her award she received 10,000 prize points redeemable for merchandise or cash. Mrs. Dietz' essay was on the theme of "As the 'boss,' here are three things I have done to cut operational costs through improved purchasing practices, or more efficient use of labor, or reduction of overhead expenses."

Plentiful Foods. The U.S.D.A. lists the following foods as expected to be plentiful during June:

Protein foods

Beef	Fish, frozen and fresh
Buttermilk	Milk—nonfat dry solids
Cheese, Cheddar	
Cheese, cottage	

Fruits and vegetables

Onions	Raisins
Potatoes	Tomatoes

Plentiful in the Midwest

Asparagus	Radishes
Beets	Rhubarb
Lettuce	Spinach
Onions, green	

Other foods

Butter	Lard
Fats and oils, edible	Peanuts and peanut butter

For every age group...

this

Broad Spectrum

DIETARY SUPPLEMENT

Regardless of cause or patient age, the need for dietary supplementation frequently arises. Whenever such supplementation is indicated to round out the intake of essential nutrients, a broad spectrum supplement—one that supplies notable amounts of all important nutrients—will serve the patient optimally.

Ovaltine in milk, a delicious food drink, has long been widely prescribed for this purpose. As the appended table shows, it supplies substantial amounts of virtually all nutrients known to take part in metabolism, from biologically top-grade protein, through the gamut of the essential vitamins, to the minerals needed in trace amounts.

Whenever the patient's nutritional state must be improved, Ovaltine deserves first consideration.

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Ovaltine

Three Servings of Ovaltine in Milk Recommended for Daily Use Provide the Following Amounts of Nutrients

(Each serving made of ½ oz. of Ovaltine and 8 fl. oz. of whole milk)

MINERALS		VITAMINS	
*CALCIUM	1.12 Gm.	*ASCORBIC ACID	37 mg.
CHLORINE	900 mg.	BIOTIN	0.03 mg.
COBALT	0.006 mg.	CHOLINE	200 mg.
*COPPER	0.7 mg.	FOLIC ACID	0.05 mg.
FLUORINE	3.0 mg.	*NIACIN	6.7 mg.
*IODINE	0.15 mg.	PANTOTHENIC ACID	3.0 mg.
*IRON	12 mg.	PYRIDOXINE	0.6 mg.
MAGNESIUM	120 mg.	*RIBOFLAVIN	2.0 mg.
MANGANESE	0.4 mg.	*THIAMINE	1.2 mg.
*PHOSPHORUS	940 mg.	*VITAMIN A	3200 I.U.
POTASSIUM	1300 mg.	VITAMIN B_{12}	0.005 mg.
SODIUM	560 mg.	*VITAMIN D	420 I.U.
ZINC	2.6 mg.		

*PROTEIN (biologically complete)	32 Gm.
*CARBOHYDRATE	65 Gm.
*LIPIDS	30 Gm.

*Nutrients for which daily dietary allowances are recommended by the National Research Council.

Cornell's Nutrition Program Gets Publicity. *Newsweek* magazine, in its April 13 issue, carried a comprehensive report of the work being done at Cornell University's School of Nutrition. The history and idea behind the school's establishment is traced, and the cooperation of the University's various departments is emphasized. A photograph of Dr. Charlotte M. Young, Professor of Medical Nutrition, demonstrating the content of the moderate-fat reducing diet, results of which were reported in the JOURNAL last year, is included in the article. The work of the experimental obesity clinic, still in operation, is described in some detail.

Diet in the Virgin Islands. Strides in improving the nutrition of Virgin Islands' natives are described in a new bulletin, *Impressions of Nutrition Habits in the Virgin Islands*. The author, Trandailer Jones, was Director of the Nutrition Service, Virgin Islands Department of Health, and according to the foreword is largely responsible for the advances made in recent years. A few years ago, thousands lived on as little as 10 cents a day and convalescents were fed "nourishment," i.e., cereal foods cooked to a mush, while vitamin deficiencies increased. The booklet describes the food resources of the Virgin Islands, the cooking methods and facilities, menu patterns, and distinctive island dishes. The work of the health department in planning family diets and food budgets is outlined, as well as its community nutrition and educational work. Points that still need attention in local dietary habits are listed. An interesting glossary of Virgin Islands food terms concludes the booklet. This booklet may be obtained from the Nutrition Division, Virgin Islands Department of Health, St. Thomas, V. I.

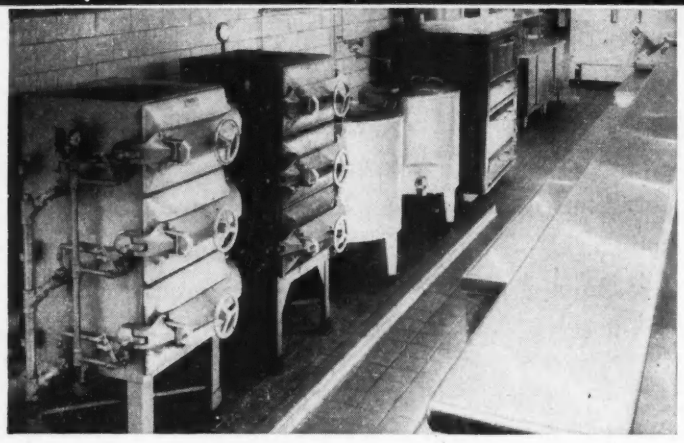
National Research Council Publications. *Sanitary Milk Control and its relation to the Sanitary, Nutritive, and Other Qualities of Milk* has recently been released as Publication 250 of the National Academy of Sciences-National Research Council. Prepared by A. C. Dahlberg, H. S. Adams, and M. E. Held, this research study was sponsored and supervised by the Committee on Milk Production, Distribution, and Quality of the Agricultural Board and the Food and Nutrition Board, National Research Council. The investigation, which was conducted in eight cities, is reported, and results are discussed under the following sections: sanitary milk control in the eight cities; factors and regulations affecting milk quality on the dairy farms; farm inspections and milk testing; factors and regulations concerned with the processing of milk; bacteriology of the pasteurized milk; flavor of the pasteurized milk; fresh pasteurized cream; composition and nutritive value of the pasteurized milk; sanitary milk regulations for farms and for milk plants; milk grades; quality of pasteurized milk and pasteurized cream, bacterial averages; the keeping-quality test; and cooperation from industry and health departments. Ninety-one tables are incorporated in this 174-page book, as well as forms used in the survey and reports.

The Safety of Mono- and Diglycerides for Use as Intentional Additives in Foods is the title of Publication 251 of the National Academy of Sciences-National Research Council. This report, by the Food Protection Committee of the Food and Nutrition Board, contains a discussion of (a) natural occurrence of mono- and diglycerides in food fats and oils formed during food preparation and during digestion of triglycerides, (b) amounts of mono- and diglycerides intentionally added to foods, (c) nutritive value of mono- and diglycerides, (d) surface activity of mono- and diglycerides, and (e) evaluation. Tables accompanying the text list the consumption of major processed foods and the estimate of maximum foreseeable per capita consumption of added mono- and diglycerides in processed foods. The report is documented by a bibliography of sixty-eight references.

Group Methods of Weight Reduction. Just issued is the second report of progress of the project at Herrick Memorial Hospital, Berkeley, California, on using group methods to help people reduce. The project has been carried out over two years, the first year being more exploratory, and observations thus gained were used as the basis for the approach during the second year.

In the first year, the objective was to recognize, if possible, the factors which seem to be important in the success or

12 YEAR OLD STEAM-CHEF
helps Gimbel's win a prize!



This new kitchen at Gimbel Brothers, Milwaukee branch of the famous New York Department Store, won a prize in the Institutions contest last year, competing against the finest in the country. Standing side by side are two STEAM-CHEFS—one slightly over a year old, and the other purchased in June 1940.

Performance of the old STEAM-CHEF encouraged them to buy a new one; they put the two side by side in their new kitchen; and that kitchen won a prize from outside impartial judges, who chose it as one of the best modern kitchens in 1952.

Durability of STEAM-CHEF steamers makes their purchase a long-term investment. Some STEAM-CHEFS have been in daily use for 20 years or more. You may have occasion to buy only one in a lifetime, but you want that one to be the best, which is the cheapest in the long run. You can take advantage of the experience of Gimbel's and other leading firms throughout the country and choose STEAM-CHEF for heavy duty—"Steamcraft" for smaller kitchens.

Available for direct steam, gas or electric operation. Ask your kitchen equipment supplier, or write us for details.

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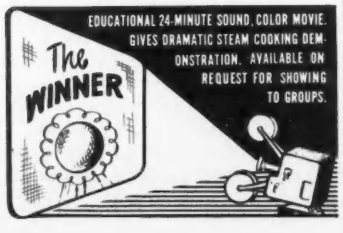
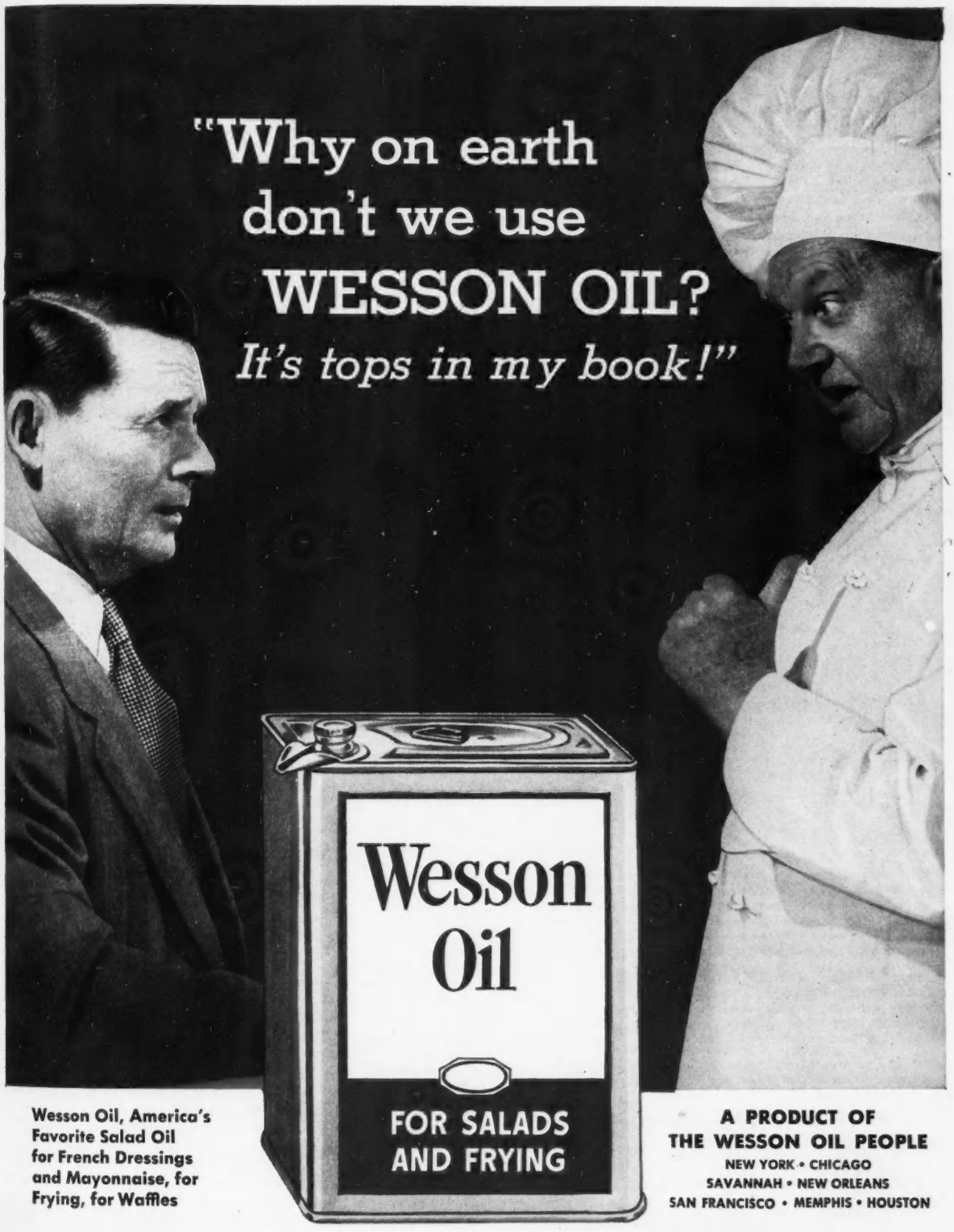

The WINNER
EDUCATIONAL 24-MINUTE SOUND, COLOR MOVIE. GIVES DRAMATIC STEAM COOKING DEMONSTRATION. AVAILABLE ON REQUEST FOR SHOWING TO GROUPS.



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failure of attempts to help people lose weight through participation in group work. An additional aim was to determine the effect on several physical tests of weight reduction by diet in a group of overweight persons. A standard reduction diet (1000 calories) in which high-cholesterol foods were omitted was adopted. In two of the groups the assumption was made that the people expected to diet, so the diet was presented right away as an authoritarian act; in three groups the diet was withheld until group discussion and decision led to a request for it; in two more groups, request for the diet was left up to the individual. Medical or nutritional advice was available to each group as the need was felt for such discussion and members initiated the request for it.

The orientation of the second study was also to the practicability of group approaches for a community, that is, to test methods which can most likely be developed in the average community. In line with this orientation, such methods as individual psychotherapy and intensive group psychotherapy, which are relatively less available, were not included.

In the first year of the project, 77 participants lost a total of 931 lb., and in a follow-up a year later, it was found that 28 had continued to lose. The total weight loss during the second year's sixteen-week program by 78 people was 1746 lb.

The report now available records the methods used and results obtained, with the major portion of the book devoted to detailed reports of each group's meetings as written up by the group leader. A limited number of these reports are available to agencies with a professional interest in nutrition by writing William D. Simmons, Administrator, Department of Research, Herrick Memorial Hospital, 2001 Dwight Way, Berkeley 4.

Canadian Dietetic Association Convention. Dr. E. Neige Todhunter, Dean, School of Home Economics, University of Alabama, Tuscaloosa, has chosen "Dietetics—Old and New" as her topic for the Violet Ryley-Kathleen Jeffs Memorial Lecture. The lecture will be presented on June 15 at the Canadian Dietetic Association convention in Ottawa.

Tri-State Hospital Assembly. The 23rd Annual Tri-State Hospital Assembly was held in Chicago, May 4 through 6, sponsored by the hospital associations of Illinois, Indiana, Michigan, and Wisconsin. On May 4, a two-day Conference of Dietitians, sponsored by the dietetic associations of these states, was held. Lendal H. Kotschevar, Teachers College, Columbia University, talked on "It's Only the Baker and Candlestick Maker," and Isola Denman Robinson, Dietetics Specialist, American Hospital Association, discussed "Food Costs—Dietary Services Offered by the American Hospital Association." On the second day, Ruth Dean Andersen, The Clark Restaurant Company, Cleveland, spoke on "Everyday Questions Confronting the Busy Dietitian," while Beulah Hunzicker, President, A.D.A., took as her title of her presentation to the group "Your Administrator and You."

Nutrition Foundation Meeting. Unwise, excessive eating and drinking are destroying the health and lives of twenty million or more Americans, according to Dr. Charles Glen King, Scientific Director, The Nutrition Foundation, Inc. In addressing a meeting of the Board of Trustees of the Foundation in Chicago on April 30, Dr. King added that only about one-fourth of the U. S. population consumes a good or excellent diet. This is true despite the facts that: the nation contains enough available resources to furnish an ideal diet for everyone; economic resources and transportation are sufficient to make the proper nutrients within reach for almost all persons; and high industrial standards protect the quality and appearance of foods. Better health through diet, Dr. King said, may be approached through wider nutrition education, through research, and through training of professional nutrition personnel. With these advantages, nutritional science during the next ten years could improve the health, economy, and total strength of the nation, and accomplish such specific goals as: (a) a sharp decrease in heart and circulatory disease, diabetes, and liver disease, plus lower incidence of

Here's

More Coffee Flavor

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SOUP MIXES
W-B Chicken Soup Mix
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PURE EGG NOODLES
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HOT CHOCOLATE
CHOCOLATE SYRUP
HOT FUDGE
SPICES
CHILI CON CARNE
EXTRACTS
COLORINGS
SALAD DRESSINGS
MAYONNAISE
FRENCH DRESSING
THOUSAND ISLAND DRESSING
CREAM DESSERTS, with sugar and milk, Lemon, Chocolate, Butterscotch, Vanilla, Tapioca and Asst'd.
GELATIN DESSERTS, Orange, Lemon, Lime, Strawberry, Raspberry, Cherry Asst'd and Asst'd Red. Plain Unsweetened.
MALTED MILK, plain.

There are many tastes to please in a hospital—nurses, patients, doctors, the administrative staff. In coffee *all* want FLAVOR. Millions enjoy Continental Coffee because it has the *most* in flavor—delicious, winey-rich, full-bodied and unvaryingly fine—kept so by special Automatic Roasting Controls that maintain exact uniformity.

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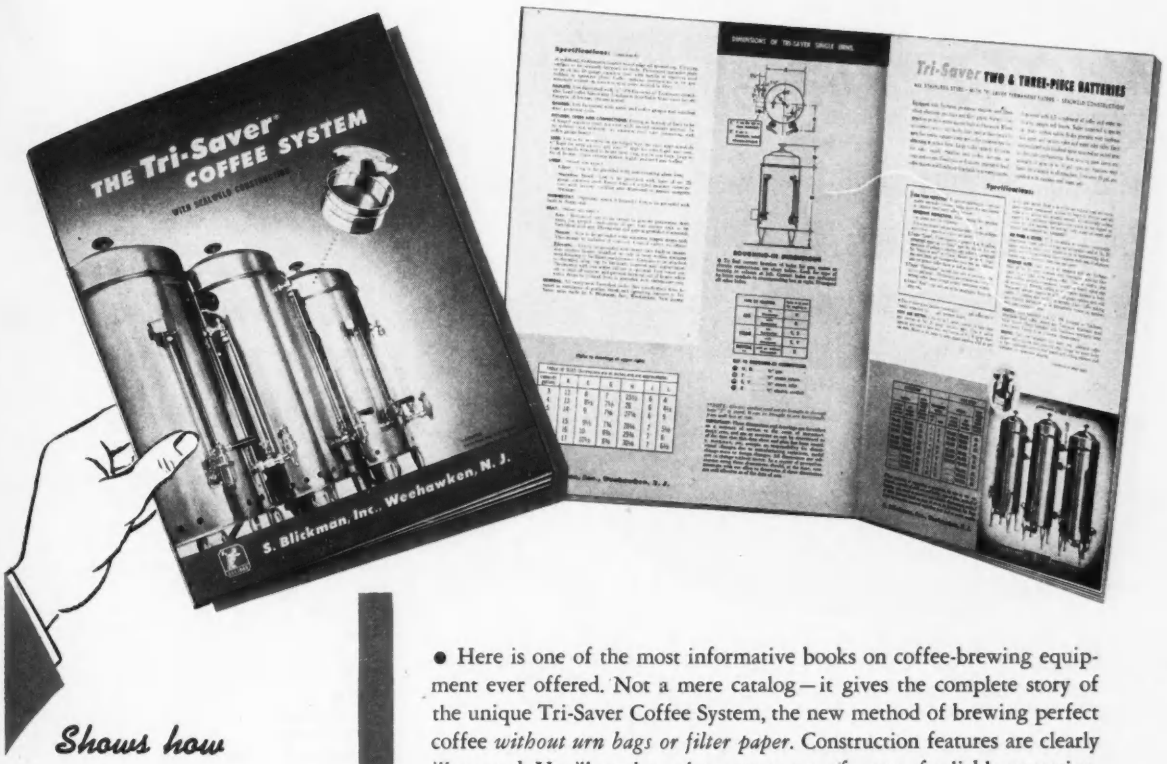
valuable illustrated book gives you all the facts, specifications, dimensions



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- **Tri-Saver edge filtration yields a full-strength brew**
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If you're interested in long service life, trouble-free coffee-making and a consistently delicious brew — "Tri-Saver" is the best investment you can make. Send for this valuable handbook now. Copies are limited. Kindly write on your letterhead.

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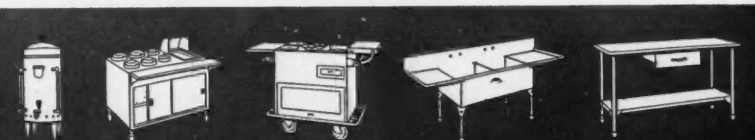

cancer; (b) steady lowering of the maternal and infant death rate; (c) a 5 to 10 per cent decrease in incidence of dental caries; (d) an increase in the day-to-day level of mental and physical performance; (e) possible disappearance of such nutritional diseases as scurvy, rickets, and nutritional anemia; and (f) decrease in diseases associated with glandular failure, e.g., arthritis; and of many nervous disorders.

George A. Sloan, President of the Foundation, announced that since January 1942, food processing and related companies have contributed or pledged close to $5 million to the Foundation. The Foundation, in turn, has made research grants totaling over $3 million to universities and medical centers in the U. S. and Canada, and a substantial amount of the balance has been earmarked for nutrition research and education in the immediate years ahead.

The Board of Trustees made grants to eleven educational institutions and the National Research Council for research projects, prior to the meeting.

Summer Course. Cornell University is again this year offering courses in institutional management as part of its summer session in home economics. The courses, which will satisfy A.D.A. academic requirements, are in quantity cookery, food service organization and administration, and special problems for graduate students. Also offered are a thesis and research program and a seminar in institution management which will review new developments, including the contributions of research, relevant to various aspects of food service administration or managerial dietetics. The summer session will be held from July 6 to August 15. Further information and application forms may be obtained from: Director of the Summer Session, 245 Goldwin Smith Hall, Cornell University, Ithaca, New York.

Interns Graduate. Diplomas were presented on April 23 to the sixteen graduates of *Vancouver General Hospital's* twenty-fifth class of dietetic interns. Representatives from each of the preceding classes were invited to mark the occasion. Ethel C. Pipes, former Director of Dietetics and responsible for first establishing the course on an A.D.A.-approved basis, spoke briefly of the early years. Dr. J. F. McCreary, as guest speaker, outlined the highlights of nutritional developments over the past quarter century. Frances Wyness Lantz of the charter class of 1929 presented the diplomas to the following graduates: Arlene Anderson, Marion Blair, Marjorie Cotter, Shirley Dean, Elizabeth Derry, Mary Glass, Lucille Gordon, Lydia Kolodinsky, Julia Lindsay, Dawn MacAulay, Juanetta Mercer, Carol Miller, Daphne Oxland, Josephine Penman, Margaret Pousette, and Rose Marie Ulrich.

On June 30, six dietetic interns will complete their administrative internship at *Aetna Life Insurance Company*, Hartford, Connecticut. They are: Martha Brown, Justine Ford, Ruth Gebbie, Anne Langballe, Rita Puryear, and Joyce Williams.

Food and Container Institute Appointment. Dr. Robert G. Tischer, formerly Professor of Food Technology at Iowa State College, has been named Director of Food Laboratories for the Quartermaster Food and Container Institute for the Armed Forces, Chicago. Dr. Tischer, a graduate of Louisiana State University, received his doctorate in food technology at the University of Massachusetts. He is Associate Editor of *Food Research* and is currently preparing a chapter for the 1954 *Advances in Food Research*.

Booklets on Teen-Age Nutrition. Teen-agers hold the spotlight in four new publications on nutrition, compiled by Anna dePlanter Bowes, Pennsylvania Department of Health. "Let's Talk About the Teens," a twelve-page manual, presents for the lay reader the results of a mass study of teen-age nutrition made at the Ellen H. Richards Institute of The Pennsylvania State College. Findings show that the thirteen-to-fifteen-year level is the most critical age nutritionally. Boys were found to have higher intakes of all nutrients except niacin, where the girls had a slight lead. Recommendations are listed at the end of the manual. "Our Underfed Teens," designed to supplement "Let's Talk About the Teens," is a suggested discus-

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creators of BROOKPARK, DESERT FLOWER and EFFICIENCY WARE

19% Consumer food dollar spent for dairy foods

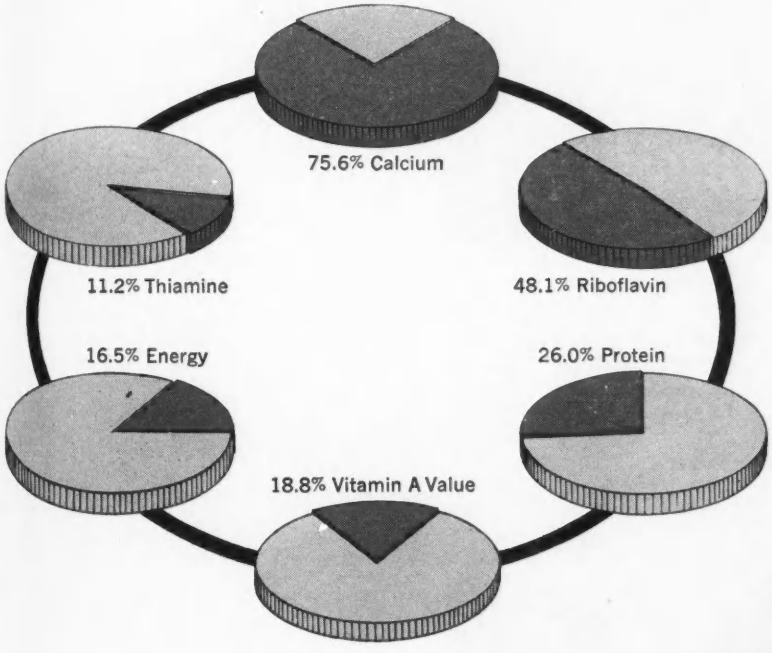
Milk, cheese, ice cream and butter cost Americans *less* than one-fifth of their food dollar.[1]

Returns from this investment in dairy foods are high, for they provide a large supply of important nutrients. For instance, more than three-fourths of the calcium available per person per day in the United States comes from dairy foods. These same foods also provide nearly one-half of our riboflavin and more than one-fourth of our protein.[2]

Calculations of the national food supply do not allow for either loss or waste in the home. Since there is no waste in dairy foods, they can be counted on to provide their full quota of nutrients.

AN ECONOMICAL INVESTMENT IN GOOD HEALTH

Percent of various nutrients in our national food supply provided by all dairy foods.



Not only the *quantity* but the *quality* of the nutrients in dairy foods is important. No calcium is better utilized than that of milk. The riboflavin of ice cream has been shown to be almost 100 per cent available to the body.[3] The protein of milk, cheese, and ice cream is well utilized for growth and maintenance of body tissue. Butter and the butterfat in dairy foods supply about one-fifth of the vitamin A in our national food supply.[2]

Milk and milk products are a good food buy, nutritionally and economically.

[1]The Marketing and Transportation Situation, Bureau of Agricultural Economics, U.S.D.A. (March-April) 1952.
[2]Data from Bureau of Human Nutrition and Home Economics, U.S.D.A., 1952.
[3]Everson, G., Wheeler, E., Walker, H., and Caulfield, W. J. Availability of riboflavin of ice cream, peas, and almonds, judged by urinary excretion of the vitamin by women subjects. J. Nutr. 35:209 (Feb.) 1948.

This seal indicates that all nutrition statements in the advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

NATIONAL DAIRY COUNCIL

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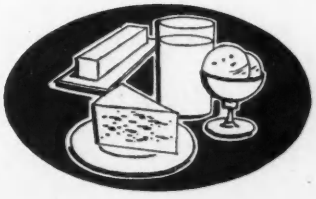

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.

sion program and action plan for women's clubs, Parent-Teacher Associations, and community organizations.

"Check Yourself on Food and Physical Well-Being" is a chart to be kept for a week at six-month intervals by the teen-ager himself and checked by the parent. Spaces are provided for: food servings for a week; sample menus; and physical condition.

"Food for Thought" is an eight-page folder designed for the teen-ager himself. It discusses nutrition and the Pennsylvania study. Food sources of nutrients are tabulated with reference to physical results if they are eaten in sufficient quantity.

These four publications are available from the Educational Department, Good Luck Division, Lever Brothers Company, 390 Park Avenue, New York 22.

South Carolina Agricultural Bulletin. *Use of Food by Farm Families in the Tobacco Farming Area of South Carolina* has been released by the South Carolina Agricultural Experiment Station as Bulletin 402. Prepared by Ada M. Moser, this publication reports facts obtained by home economists of the Experiment Station as part of a cooperative study of farm family diets in three types of southern farming areas. The major portion of the sixty-one-page report is concerned with the families' use of food in relation to dietary essentials, with separate sections on: milk; vegetables and fruits; eggs, meat, poultry, and fish; grain products; fats and oils; sugar and other sweets; and home-produced food. Other sections deal with the supply of dietary essentials; cost and money value of food; and recommendations. Results show that the outstanding year-round dietary need of these families is an increased amount of milk, although other foods are also needed. Calcium, vitamin A, and ascorbic acid were the lowest nutrients in their diets, and among low-income families protein of good quality and riboflavin were also frequently deficient. Many tables are included, among them menus used by the families and their cost. This bulletin may be obtained from the South Carolina Agricultural Experiment Station, Clemson Agricultural College, Clemson.

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CONTROLS COMPANY
ROBERTSHAW THERMOSTAT DIVISION • YOUNGWOOD, PA.

Flavorful Frozen Peas. One reason peas hold top place among commercially frozen vegetables is that processors have been aided by research in preserving fresh-pea quality. Studies from the Bureau of Agricultural and Industrial Chemistry, U.S.D.A., show that bruising peas in the pod by mechanical viners produces an off-flavor without marring appearance, and that the longer bruised peas are held before freezing, the greater the change in flavor. Chilling helps save the fresh flavor by delaying the internal chemical change which bruising produces. Some processors, therefore, have moved their viners near freezing plants for quick post-vining refrigeration; others use rapid crushed-ice cooling or hydrocooling. The U.S.D.A. advises that peas from local or home gardens be saved from long standing before cooking, or be kept cold if they must wait.

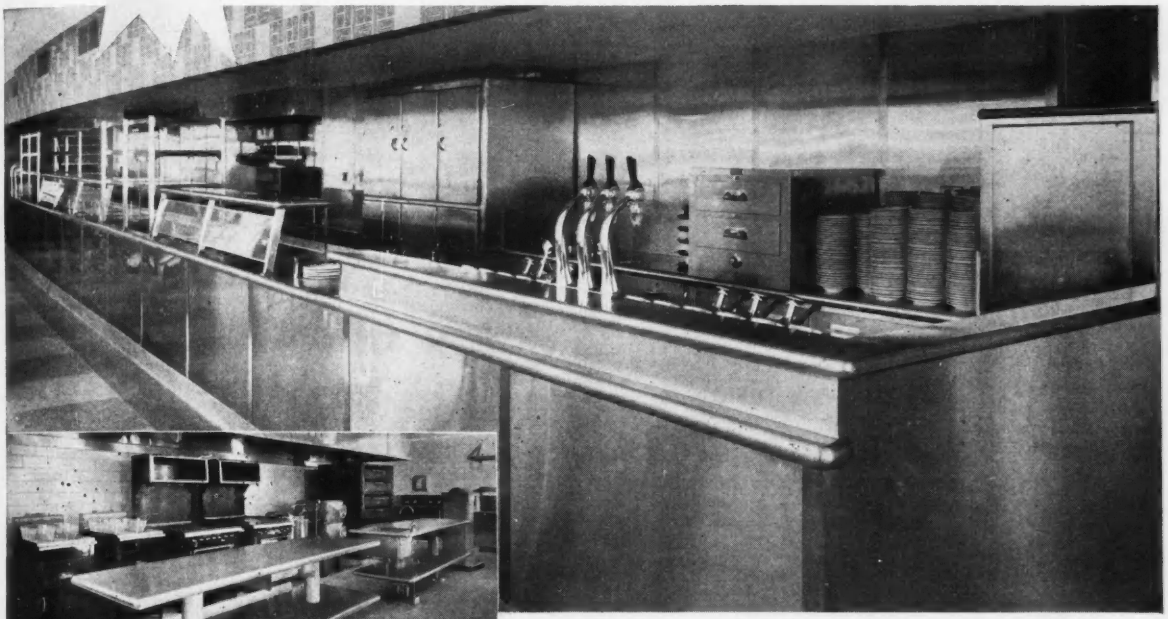
Dr. Walter Wilkins. It is with regret that the JOURNAL reports the death of Dr. Walter Wilkins, Director, Division of Nutrition Investigation and Services, Florida State Board of Health. Dr. Wilkins, who had previously been Director of School Health for the North Carolina State Board of Health, became well known during the war years, when, as Medical Nutrition Officer of the War Food Administration, he conducted many nutrition clinics and addressed professional and lay groups throughout the U. S. and Alaska. His demonstration clinics—then a new nutrition education technique—did much toward interesting the medical profession in some of the problems of "borderline" nutrition.

In 1945, Dr. Wilkins assumed the position he held at the time of his death. In this capacity, he attacked the problem of anemia, making studies with school children. He thus discovered the diurnal variation of hemoglobin level which may explain some of the seeming inconsistencies of hemoglobin levels. He invented a simple cup needle for drawing blood.

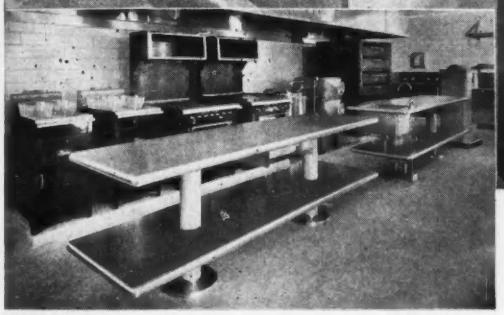
Dr. Wilkins was the co-author of *Nutrition for You* with French Boyd and Ruth Blakely, as well as a number of papers published in professional journals. He was a member of the American Public Health Association, the American Medical Association, and the American School Health Association (of which he was President in 1946–47).

ANOTHER FIRST AWARD

Blickman-Built Brass Rail installation wins top honors in Institutions contest



FIRST AWARD—Brass Rail Restaurant, 100 Park Avenue, New York City. Stainless steel lunchroom service counter.



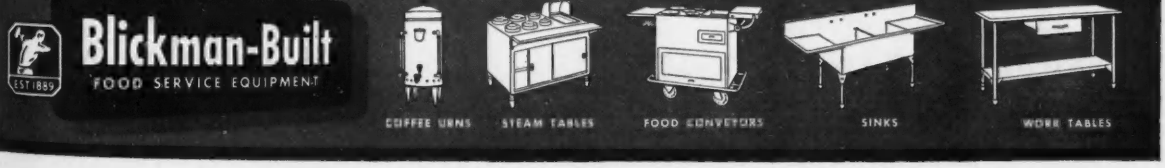
HONOR AWARD—Norton Company, Worcester, Mass. Cooking center showing stainless steel hood, cook's tables mounted on pedestals in kitchen of employee's cafeteria.

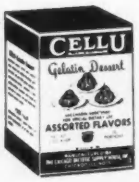
MERIT AWARD—Langchamps Restaurant, Manhattan Apartments, New York City. View in main kitchen showing stainless steel cook's and work tables.

● Three more Blickman-Built installations won honors in Institutions Magazine's 1953 food service contest—a total of 24 awards in 6 years! Only careful planning and fabrication meet the critical standards for good design, sanitation and operating efficiency required of the winning installations. Such features as welded structures, continuous crevice-free work surfaces, round-corner sinks and drawers assure durability and ease of cleaning. For service life measured in years, Blickman-Built stainless steel equipment is your soundest investment. More than 60 years of mass-feeding know-how are behind every project. You can be confident—if it's "Blickman-Built."

***Send for illustrated folder** describing Blickman-Built food service equipment — available in single units or complete installations.*

S. Blickman, Inc., 4006 Gregory Ave., Weehawken, N. J.
New England Branch: 845 Park Square Bldg., Boston 16, Mass.





Twenty Tasty Servings—
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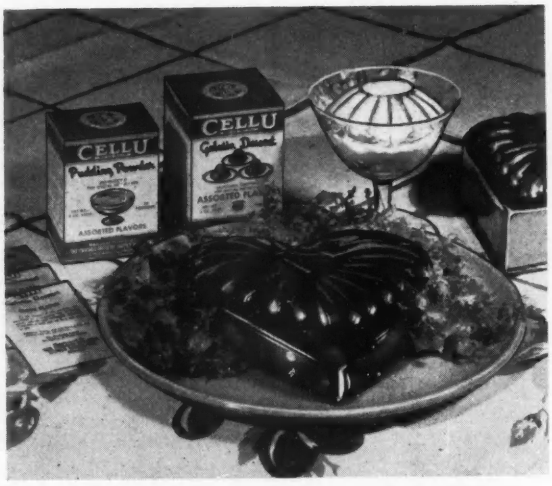
Sugar-Free Desserts—



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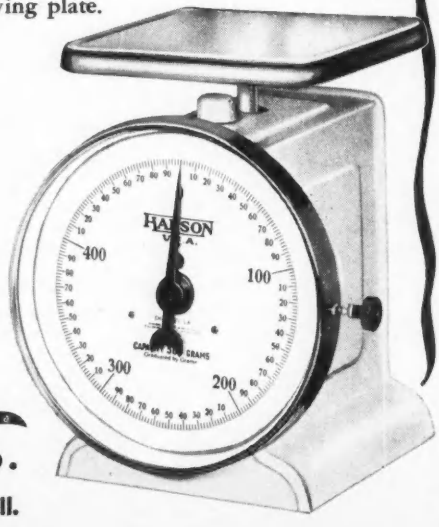
Capacity 500 grams by grams. Stainless steel platform, white enamel body, easy to keep clean.



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Model 1440 enamel dial, price $10.00

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News of State Associations

Alabama Dietetic Association. On April 24 and 25, the Alabama Dietetic Association met in Montgomery. Geraldine Piper, Chairman, Community Nutrition Section, A.D.A., was national representative. The meeting included a tribute to the late Dean Agnes Ellen Harris of the University of Alabama, and a talk on "Communicating with People" by Mary Belle Roberts, Alabama Department of Public Health.

Arizona Dietetic Association. Recordings on vocational guidance for use in high schools have been prepared by the Committee on Professional Education of the Arizona Dietetic Association. In making these records, the script of the A.D.A. was used. Another Professional Education activity of the Arizona Association was the showing, during January and February, of A.D.A. color slides to students at the University of Arizona and to home economics graduates.

Community Nutrition Section members in Arizona have used a questionnaire regarding nutritional standards for agencies and institutions providing day care for children. The state has not set up standards for child feeding either in institutions or day-care centers. As a request of the Arizona Department of Public Welfare, and not as a part of the project, consultation on food service has been provided to nine institutions caring for children.

Arkansas Dietetic Association. The Arkansas Dietetic Association convention was held in Hot Springs, May 4 and 5. A panel discussion on "Food Fads and Misinformation" was presented by: Harold Austen, Arkansas State Board of Health; Fern Williams, public health nurse, Montgomery County, Arkansas; Mary Toland Bell, Little Rock; and Barbara McDonald, Arkansas State Board of Health. Margaret Cowden Bernard, VA Hospital, Denver, spoke on "Value of Good Food Service." Eugene Lopez, Blue Cross-Blue Shield Claims Administrator, discussed "The Dietitian and Her Personnel." Louise Garrett, Wheat Flour Institute, Chicago, chose "Cereal Enrichment" as her topic.

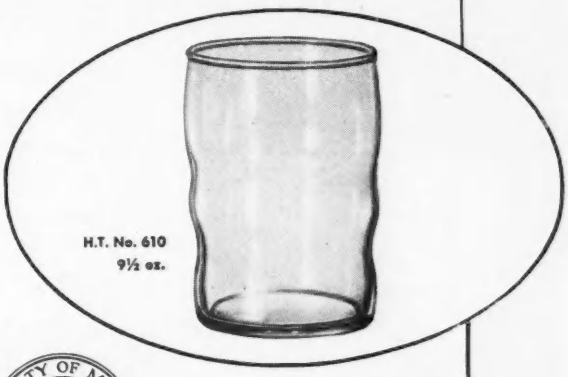
The Arkansas Dietetic Association recently received $25 for a vocational guidance project. This money was used to defray state convention expenses of two University of Arkansas students majoring in foods, who are considering careers in dietetics.

California Dietetic Association. The California Dietetic Association offers two $200 scholarships to help two dietetic interns in any approved administrative, hospital, or clinic internship in the U. S.

District of Columbia Dietetic Association. The spring meeting of the District of Columbia Dietetic Association was held in Washington on April 24. Henderika J. Rynbergen, Professional Education Section Chairman, A.D.A.,

Thrive on hard usage ... breakage low ... chippage practically non-existent

that's why the University of Michigan South Quadrangle Residence Hall standardized on Libbey Heat-Treated Tumblers in feeding its 1200 students



MANY of the country's largest hotels, restaurants, hospitals and schools send the same report: Libbey Heat-Treated Tumblers can take heavy "punishment" —that's because they're specially processed to stand up 3-5 times longer than ordinary tumblers.

For added safety, every Libbey glass has a chip-resistant rim . . . at the spot where most glassware chips first! This feature means added economy through reduced breakage, smaller needed inventory and fewer glassware replacements. And every Libbey glass has the additional money-saving protection of this famous guarantee: "A new glass if the rim of a Libbey 'Safedge' glass ever chips!"

Why not see how Heat-Treated Tumblers can cut your glassware costs and at the same time give you a better glassware service? Your Libbey supply dealer has samples and prices of the full line. See him or write direct to Libbey Glass, Toledo 1, Ohio.

This recently completed University of Michigan South Quadrangle Residence Hall was built at a cost of well over 5½ million dollars. It is recognized as one of the most modern dormitories in the country. 1200 students live here according to the Michigan House Plan which divides the Quadrangle into seven house groups and four dining rooms.

LIBBEY GLASS *Bounce Tumblers*

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spoke on "Philosophy of Present Trends in Teaching Diet Therapy and Nutrition to the Student Nurses." Representatives from schools of nursing and from nursing groups in the city were invited to attend the annual dinner and to hear Miss Rynbergen speak.

Community Nutrition Section members of the District of Columbia Association this year are working with the D. C. Medical Society on its project, Obesity. Dietitians will help to work up a set of nutritionally adequate reducing diets for the doctors to use with their patients.

Georgia Dietetic Association. Two $150 scholarships were awarded to outstanding home economics seniors at the University of Georgia and the Georgia State Teachers College for Women at the Georgia Dietetic Association's semi-annual spring meeting in Atlanta on May 8. The scholarships will be used by the girls during internships in hospitals of their choice.

Marjorie Cantoni, Heart Section, U. S. Public Health Service, Washington, D. C., spoke to the group on "Nutrition in Cardiovascular Disease." "Problems in Emergency Feeding" was the topic of Karl Reiser, Federal Civil Defense Administration. Dr. Mary Speirs, Georgia Agricultural Experiment Station, discussed "Additives to Foods." Dr. Helga Eliot, Crawford W. Long Hospital, Atlanta, gave the banquet speech, "Nutrition in the Argentine."

Hawaii Dietetic Association. Post-convention activities are being planned by the Hawaii Dietetic Association for members who travel farther west after the A.D.A. Annual Meeting. The program, outlined on page 612, will be held from Monday, August 31, through Thursday, September 3, and will consist of tours and social activities of interest to dietitians.

Indiana Dietetic Association. Indianapolis was hostess to members of the Indiana Dietetic Association for their 21st annual convention, April 29 and 30. Grace Bulman, President-Elect, A.D.A., was the official national representative. Speeches on the program included:

"Research in Dietetics"—Jean Schaberg, Methodist Hospital, Fort Wayne
"Practical Aspects of Low-Sodium Diets"—Marjorie E. Cantoni, Nutrition Consultant, U. S. Public Health Service
"The Cholesterol Problem in Nutrition"—Dr. S. O. Waife Editor, *Journal of Clinical Nutrition*
"Army Hospital Food Service"—Capt. Thelma Harmon, Camp Atterbury
"Quality Foods"—Hazel Fullereide, Withrow High School, Cincinnati
"Personnel Management from Human Relations Standpoint"—Charles A. Gillespie, Allison Division, General Motors Corporation

Minnesota Dietetic Association. The *Twin City Dietetic Association* was entertained in December by the Zinsmaster Baking Company, Minneapolis. Barbara Davis, television star for the bakery, gave a "behind-the-scenes" glimpse of some of the problems encountered in presenting a weekly program. The Association's February meeting, held at the Betty Crocker experimental kitchens of General Mills, Inc., included a tour of the kitchens and a presentation of color slides on "Fashions in Foods."

Nebraska Dietetic Association. All four section chairmen of the Nebraska Dietetic Association have recently cooperated with the State Division of Child Welfare in offering nutritional information and assistance to child-care institutions and homes. The committee composed a two-page spread titled "Food for Thought" for the first issue of a new Child Welfare Department bulletin which was sent to all child-care homes in Nebraska. The spread contained information on food nutrients and the "Basic Seven," listed plentiful foods as given by the U. S. Department of Agriculture, and presented suggestions for favors to add sparkle to Valentine's Day and Easter menus.

New Jersey Dietetic Association. Richard B. Johnson, Training Coordinator, Port of New York Authority, addressed members of the New Jersey Dietetic Association on "How to Work Effectively with Subordinates" at their April meeting in Newark.

Ohio Dietetic Association. The 32nd Annual Convention of the Ohio Dietetic Association was held in Cleveland, April 24 and 25. Le Velle Wood, Treasurer, A.D.A., spoke on Association affairs as the official representative.

Clarice Gullickson, Veterans Administration, Washington, D. C., discussed "Planning for Efficient Food Production and Service." This was followed by a panel discussion on:

"Leadership"—Eleanor Miller, Stouffer Corporation, Cleveland
"Buying Procedure"—B. Frank Copp, Stouffer Corporation, Cleveland
"Small Group Supervision"—Louise Barthold, General Electric Company, Cleveland
"Controlled Costs"—Grace Frick, Russet Cafeteria, Cleveland

In the session on "Maternal and Child Nutrition," Dr. Icie Macy Hoobler, Children's Fund of Michigan, Detroit, spoke on maternal and infant nutrition, while Dr. Genevieve Stearns, State University of Iowa, Iowa City, chose nutrition of children from preschool age through adolescence as her topic.

Section round tables were held as follows: "Action Programs in Maternal and Child Nutrition in Ohio" by the Community Nutrition Section; "Dietitian-Patient Relationship," the Diet Therapy Section; "Dietary Assistants," Food Administration; and "Dietary Experience of Student Nurses," Professional Education.

Another panel discussion, "Quality Food—Here's How," was given by: Eva Ylvisaker, Children's Hospital, Cincinnati; Winifred Eliason, Greenfield-Mills Restaurant Company, Detroit; Mary

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The result of years of research, Dietetic Tuna is packed by a special procedure from selected light-meat tuna. The chemical composition and the nutritive properties of Dietetic Tuna are under constant laboratory supervision.

Typical average composition of drained contents	
Total solids	30.6%
Protein	28.3%
Fat	0.75%
Cholesterol	.07%
Sodium	70 mg. %
Iodine	17 mcg. %
Fluorine	20 ppm
Riboflavin	116 mcg. %
Niacin	13.7 mg. %
Animal Protein Factor B_{12}	12 mcg. %
(122 calories per 100 grams)	

Well proportioned combination of all essential amino acids (Values given as percent of protein)	
Arginine	5.2
Histidine	5.7
Isoleucine	4.7
Leucine	7.0
Lysine	8.3
Methionine	2.8
Phenylalanine	3.5
Threonine	4.1
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Valine	5.2

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Please send samples and complete information on DIETETIC TUNA.

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Letherman, Mount Carmel Hospital, Columbus; Ruth Van Sickle, Factory Stores, Cleveland; and Mary Farnam, Cleveland Heights Schools.

Dr. Max Miller, University Hospitals, Cleveland, talked on "Bases for Therapeutic Diets," and Dr. George Hamwi, University Hospital, Columbus, spoke on "Cardiovascular Disease and Diet."

Pennsylvania Dietetic Association. In connection with Diabetes Week, members of the *Philadelphia Dietetic Association* conducted three classes in April and May to help patients with diabetes and their families. These classes have been presented semi-annually for the past four years at the request of the physicians of Philadelphia. At the first lecture, two brief motion pictures "What Is Diabetes" and "Eating for Good Health," were shown. The *Philadelphia Association's* March meeting was held at Jefferson Medical College. Martha Smith Fry conducted a simulated interview between dietitian and patient to show the different results of a poorly planned and of a well organized interview.

Virginia Dietetic Association. Richmond was headquarters for the 24th Annual Meeting of the Virginia Dietetic Association, April 16 and 17. A session on audio-visual aids was held, including:

"What Are Audio-Visual Aids and What Are Their Uses?"—Nathaniel N. Noble, Reynolds Metals Company, Richmond

"Simplicity of Equipment for the Dietitian's Use"—Daniel W. Browning, Ideal Pictures Company, Richmond

"Effects of the Use of Audio-Visual Aids in the Field of Dietetics and Home Economics" and "Sources of Information Available to Dietitians from Commercial Fields"—Katherine R. Smith, National Canners Association, Washington, D. C.

Other speeches on the program included:

"Teaching Pre-Natal Patients in Classes"—Dorothy Rowe, Madison College, Harrisonburg

"Army Dietitians and Internships"—Capt. Mary Behlen, WMSC

"Relationship of Antibiotics to Human Nutrition"—Dr. Count Gibson, Medical College of Virginia, Richmond

"New Hospital Jitters for the Dietitian"—Dorothy Tate, University of North Carolina Hospital, Chapel Hill

Corinne H. Robinson, Diet Therapy Section Chairman, A.D.A., the official representative, spoke on Association affairs.

Dr. Stanley W. Levenson, Medical College of Virginia, Richmond, was the banquet speaker. His talk was titled "Medical and Surgical Problems in Korea."

West Virginia Dietetic Association. The annual spring meeting of the West Virginia Dietetic Association was held at Jackson's Mill on May 1, in connection with the Home Economics Association.

Recent activities of the *Charleston Dietetic Association* have included the following: In February, the Association met at the Memorial Hospital to hear Kathryn Trent, Director of Nursing, discuss "Interdepartmental Relations." In March, members learned about overseas experiences of dietitians and nurses. Betty Holey spoke on her experiences as an Army dietitian in Europe, and Marian Hadfield discussed her three years as a nurse in the northern part of India. The Charleston group is now planning a series of radio programs to be presented over a local station.

Association Activities

A.D.A. Exhibits. The *Georgia Public Health Association* and the *Southern Branch, American Public Health Association* met April 21 through 24 in Atlanta. A.D.A. was one of the scientific exhibitors, displaying "Achieve Your Proper Weight and Keep It." Serving as exhibit chairman for the Georgia Dietetic Association was Helen Batson Bose, assisted by other members of the state association.

The A.D.A. exhibit, "To Hospital Administrators," was displayed May 25 through 28 during the *Catholic Hospital Association* meeting in Kansas City, Missouri. Local exhibiting co-chairmen were Betty Pote Bowman and Esther Williams who manned the booth with their committee workers.

The Buffalo Dietetic Association sponsored the display of the A.D.A. exhibit, "Adequate Low-Calorie Diet with Adaptations" for *Erie County Health Week* observed in Buffalo, May 17 through 23. The exhibit was requested by the Erie County Health Department.

National Health Council. Our Association has recently been accepted as a member of the National Health Council. June Bricker, one of our three delegates, attended a meeting of the delegates of the National Health Council on May 12 in New York City.

Canadian Dietetic Association. The Annual Meeting of the Canadian Dietetic Association will be held in Ottawa June 15 through 17. June Bricker will be our official representative.

News of Advertisers and Exhibitors

Metropolitan Wire Goods Corporation is now offering a thirty-six-compartment Sani-Stack glass rack with individual welded cells for each glass. Compartmented glass racks can be stacked and more than four hundred can be moved at a time on a dolly. A thousand can be moved on a 5-ft. flat truck. These racks are obtainable in all sizes for every type of glass and model of dishwashing machine.

A second new product of *Metropolitan Wire Goods Corporation* is a Sani-Stack Imperial Creamer Rack designed for silver and china creamers. Actually a rack within a rack, it has an outer shell of wire acting as a protection for a plas-

Meat...

and the Therapeutic Value of Adequate Protein

Much evidence can be cited in favor of a high protein intake after surgery, trauma, infection, or burns. In supporting the many anabolic and defense mechanisms of the organism in physiologic stress,[1] high-quality protein—such as that of meat—assumes the status of an important therapeutic agent.[2]

Phagocytic activity,[3] formation of antibodies,[4] and rapid healing of wounds[5] are favorably affected by ample protein nutrition. Remission of peptic ulcer,[6] improved resistance to infectious disease,[4] and maintenance of plasma proteins after surgery[7] are other therapeutic effects attributed to an ample protein intake. In the management of ulcerative colitis, protein represents a primary need.[8] Recent advances in the treatment of extensive burns and of hepatic disease emphasize the value of high protein feedings.[9]

These experimental and clinical findings establish the therapeutic value of high protein intake.[10] To assure therapeutic protein adequacy, the dietary should provide a liberal margin of protein over normal requirements.

Meat is an important source of high-quality protein, containing essential as well as nonessential amino acids. In addition, it supplies significant amounts of B group vitamins and of iron, phosphorus, and other needed minerals.

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This attractive booklet is a guide to better food and food service in the small institution.

Based on normal nutritional requirements for adults, the menu patterns, sample suppers, and pointers on meal planning have their place in any household. Practical ideas for making the work of the manager easier and pleasanter include a weekly marketing guide, hints for economy in buying and storage, and suggestions for serving.

This is a project of the Diet Therapy Section of The American Dietetic Association.

Single copy 50¢

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Order from:
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tisol-coated insert into which creamers are placed. This plastisol insert prevents scratching, chipping, or marking of creamers which ordinarily occurs from direct contact with metal. The rack measures 10 by 14¾ by 3½ in., enabling it to be placed in any standard open rack and passed through the dishwasher. It will accommodate twenty-four unhandled creamers of 1- or 2-oz. capacity. Special sizes can be made to fit every size or shape of cream pitcher. These racks are equipped with stacking lugs for ease and convenience in storage.

Wyandotte Chemicals Corporation has just opened new research laboratories for studies of the problems of the food and laundry industries. A third part will be an industrial laboratory. The new food industries laboratories are comprised of facilities for: microbiologic studies, physical and chemical testing of hand and mechanical dishwashing, and study of scale and film problems. Also available is a nucleonics laboratory where soils are tagged with radioactive tracers to measure the efficiency of various cleaning materials.

A new addition to *Wyandotte Chemicals Corporation's* long line of "firsts" is "Antibac." This chlorine germicide combines the advantages of the organic germicide with the quick lethal action of the hypochlorites. Use-solutions of this mildly acidic germicide produce molecular hypochlorous acid, generally recognized as the most lethal form of chlorine to bacteria.

Crimsco, Inc. has recently developed a new stainless steel model of the Meals-On-Wheels cart. This model, M-18-D, features an adjustable tray compartment which accommodates standard hospital trays ranging in size from 14 × 16 in. to 16 × 22 in. Movable tray racks within each of two cold tray compartments adjust to individual hospital tray sizes and will hold eighteen trays. The oven compartment accommodates eighteen hot portions. Standard trays and dishes already in use in the hospital may be used. Positioning racks equipped with electrical outlets are provided on the service shelf for separate hot or cold thermal beverage containers.

The Salvajor Company's WasteXit line now includes a low-priced disposer, the Model L. This ½-H.P. unit, designed for either large or small food service operations, is a shredder-cutter type disposer which handles mixed, cooked, and uncooked food waste including leafy preparation waste, bones, entrails, rinds, and other wastes. Multiple installations of two or more units may be made. The unit fits under any work table of standard height.

Universal Dishwashing Machinery Company has developed a new mechanical dishwasher—the Model B—designed for diet kitchen, small restaurant, and soda fountain installation. This machine is self-supported on adjustable legs for a work-table height of 20½ to 35½ in. *Universal* gas-, electric-, or steam-operated final rinse boosters are available for installation to supply the required temperature of 180°F. for final rinse water.

Another new *Universal Dishwashing Machinery Company* product is a new single-tank dishwashing machine known as the Model S. This machine is designed with three doors for either straight-through or corner installation and is constructed with reversible truck guides and door pulleys for simplified position changes. In addition, two doors operate simultaneously and a single-handle operating control interlocks all three doors during the dishwashing cycle and prevents operation when the doors are open. Controls are available for automatic timing of wash and rinse cycle. The manufacturer further states that a more complete washing coverage is produced by a revolving power wash above and below the dishes which produces relative motion in the wash cycle. Safe and thorough sterilization is obtained due to revolving balanced rinse arms above and below the dishes providing a complete rinsing coverage.

Automatic Food Shaping Machine Company announces a new Model 4AC, which has a production capacity of 3600 meat patties, hamburgers, of fish cakes per hour. This model has a thickness adjustment feature which changes thicknesses and weights within the range limits of the various diameter molds available (2 in., 3 in., and 3½ in.). The manufacturer can also make special molds to meet individual requirements. Crumb box assemblies can be installed for coating the bottoms and/or tops of fish cakes.

Gerber Products Company has developed Teething Biscuits as a new addition to its line of toddlers' delicacies. These biscuits, sold ten in a package, are individually wrapped and cellophane-sealed and will not easily crumble or break. They also provide a snack which does not dull the mealtime appetite.

Another new *Gerber* product is Gerber's Orange Juice, available in 4-oz. cans and specially processed to suit baby needs and tastes. The pasteurized juice is strained finely enough to be used "as is" in the nursing bottle. Before shipping, the juice is stored in cool warehouses at a fixed temperature.

"Ice Cream, an Important Food" is the title of a new folder released by *National Dairy Council*. Attractively designed in gray and salmon pink, the folder presents the nutrient content of vanilla ice cream as compared with that of whole milk; the composition of ice cream; and miscellaneous facts about this dessert. The calories in ice cream are compared with those in other desserts, and ice cream is suggested as a pleasing adjunct to a diet moderately restricted in calories.

The *Groen Manufacturing Company* has just published a new forty-four-page booklet titled "Cooking the Modern Way," Prepared by Alberta Macfarlane, food service consultant, it is a methods guide, promoting the use of steam-jacketed kettles. A general section on the principles of cookery with steam-jacketed kettles introduces the booklet. Sections follow on the use of this type of equipment for cooking vegetables, coffee, meat, poultry, soup, cereals, fruit, and eggs. Tips on installation conclude the booklet.